

# ONKYO SERVICE MANUAL

## QUARTZ SYNTHESIZED TUNER AMPLIFIER MODELS TX-830/TX-830M

### Black model

|                     |                      |
|---------------------|----------------------|
| BHUD, BHUDN, MBHUDN | 120V AC, 60Hz        |
| BHUG                | 220V AC, 50Hz        |
| BHUQA               | 240V AC, 50Hz        |
| BHUW                | 120/220V AC, 50/60Hz |

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\Delta$  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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**ONKYO**  
**AUDIO COMPONENTS**

# SPECIFICATIONS

## AMPLIFIER SECTION

|                            |                                                                                                                                        |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Power output:              | 58 watts per channel, min. RMS, at 8ohms, both channels driven, from 20Hz to 20kHz, with no more than 0.08% total harmonic distortion. |
| Musical Power Output:      | 2 × 150 watts at 4 ohms, 1kHz (DIN)<br>2 × 90 watts at 8 ohms, 1kHz (DIN)                                                              |
| Continuous Power Output:   | 2 × 85 watts at 4 ohms, 1kHz (DIN)<br>2 × 65 watts at 8 ohms, 1kHz (DIN)                                                               |
| Total Harmonic Distortion: | 0.08% at rated power<br>0.08% at 1 watts output                                                                                        |
| IM Distortion:             | 0.08% at rated power<br>0.08% at 1 watts output                                                                                        |
| Damping Factor:            | 40 at 8 ohms                                                                                                                           |
| Frequency Response:        | 20-30,000Hz ±1dB                                                                                                                       |
| RIAA Diviation:            | 20-20,000Hz ±0.8dB                                                                                                                     |
| Sensitivity and Impedance: | Phono: 2.5mV/50 kohms<br>CD: 150mV/50 kohms<br>Tape Play: 150mV/50 kohms<br>Tape Rec: 150mV/3.5 kohms                                  |
| Phono Overload(MM):        | 120mV RMS at 1kHz, 0.08% THD.                                                                                                          |
| Signal-to-Noise Ratio:     | Phono: 85dB(at 10mV input, A weighted)<br>75dB(IHF A-202)<br>CD/Tape: 95dB(A weighted)<br>80dB(IHF A-202)                              |
| Tone controls:             | Bass: ±10dB at 100Hz<br>Treble: ±10dB at 10kHz                                                                                         |

## TUNER SECTION

### FM:

|                                |                                                                                                                                                              |                                                  |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
|                                | <b>-220V/240V/ Worldwide models-</b>                                                                                                                         | <b>-120V model-</b>                              |
| Tuning Range:                  | 87.50-108.00MHz(50kHz steps)<br>87.50-108.00MHz(50kHz steps) or<br>87.9-107.9kHz(200kHz steps) (Worldwide model)                                             | 87.9-107.9kHz(200kHz steps)                      |
| Usable Sensitivity:            | Mono: 12.8dBf, 1.2 μV, 75ohms<br>1.0 μV(S/N 26dB, 40kHz Devi.)<br>75ohms DIN<br>Stereo: 18.0dBf, 2.2 μV, 75ohms<br>23μV(S/N 46dB, 40kHz Devi.)<br>75ohms DIN | Mono: 11.2dBf, 2.0 μV<br>Stereo: 17.2dBf, 4.0 μV |
| 50dB Quieting Sensitivity:     | Mono: 18.0dBf, 2.2 μV, 75ohms<br>Stereo: 37.2dBf, 20μV, 75ohms                                                                                               | Mono: 17.2dBf, 4.0 μV<br>Stereo: 37.2dBf, 40μV   |
| Capture Ratio:                 | 1.5dB                                                                                                                                                        | 1.5dB                                            |
| Image Rejection Ratio:         | 85dB                                                                                                                                                         | 40dB                                             |
| IF Rejection Ratio:            | 90dB                                                                                                                                                         | 90dB                                             |
| Signal-to-Noise Ratio:         | Mono: 72dB<br>Stereo: 66dB                                                                                                                                   | Mono: 72dB<br>Stereo: 66dB                       |
| Alternate Channel Attenuation: |                                                                                                                                                              | 55dB                                             |
| Selectivity:                   | 50dB DIN( ±300kHz, 40kHz dev.)                                                                                                                               |                                                  |
| AM suppression Ratio:          | 50dB                                                                                                                                                         | 50dB                                             |
| Harmonic Distortion:           | Mono: 0.15%<br>Stereo: 0.30%                                                                                                                                 | Mono: 0.15%<br>Stereo: 0.30%                     |
| Frequency Response:            | 30-15,000Hz ±1.5dB                                                                                                                                           | 30-15,000Hz ±1.5dB                               |
| Stereo Separation:             | 45dB at 1kHz<br>30dB at 100-10,000Hz                                                                                                                         | 45dB at 1kHz<br>30dB at 100-10,000Hz             |
| Muting Level:                  | 17.2dBf, 4.0μV                                                                                                                                               | 17.2dBf, 4.0μV                                   |
| <b>AM:</b>                     |                                                                                                                                                              |                                                  |
| Tuning Range:                  | 522-1611kHz( 9kHz steps)<br>522-1611kHz( 9kHz steps) or<br>530-1620kHz(10kHz steps) (Worldwide model)                                                        | 530-1620kHz(10kHz steps)                         |
| Usable Sensitivity:            | 30μV                                                                                                                                                         | 30μV                                             |
| Image Rejection Ratio:         | 40dB                                                                                                                                                         | 40dB                                             |
| IF Rejection Ratio:            | 40dB                                                                                                                                                         | 40dB                                             |
| Signal-to-Noise Ratio:         | 40dB                                                                                                                                                         | 40dB                                             |
| Harmonic Distortion:           | 0.7%                                                                                                                                                         | 0.7%                                             |

## GENERAL

|                        |                                                   |
|------------------------|---------------------------------------------------|
| Dimensions(W × H × D): | 435 × 130 × 351mm<br>17-1/8" × 5-1/8" × 13-13/16" |
| Weight:                | 8.2kg., 18.1lbs.                                  |

**REMOTE CONTROL TRANSMITTER RC-119S/RC-118S**

Transmitter: Infrared  
 Signal range: Approx. 5meters(16ft.4")  
 Power supply: TWO "AA" batteries (1.5V×2)  
 Dimensions(W×H×D): 64×18×176mm  
 2-1/2" × 3/4" × 7"  
 Weight: 140grams 5.0oz.(including batteries)

Specifications and features are subject to change without notice.

## SERVICE PROCEDURES

### 1. Replacing the fuses

For continued protection against fire hazard, replace only with same type and same rating fuse.

D (120V) model

| Circuit no. | Part no. | Description         |
|-------------|----------|---------------------|
| F901        | 252050   | 5 A (ST-6), Primary |

G (220V) and Q (240V) models

| Circuit no. | Part no. | Description                                 |
|-------------|----------|---------------------------------------------|
| F902        | 252075   | 2.5A-SE-EAK, Primary                        |
| F903        | 252075   | 2.5A-SE-EAK, AC outlet<br>(Only 220V model) |

|      |        |                      |
|------|--------|----------------------|
| F906 | 252070 | 1A-SE-EAK, Secondary |
|------|--------|----------------------|

W (Worldwide) model

| Circuit no. | Part no. | Description          |
|-------------|----------|----------------------|
| F901        | 252050   | 5A (ST-6), Primary   |
| F902        | 252075   | 2.5A-SE-EAK, Primary |

### 2. Change of FM/AM band step.

With the exception of the models below, a BAND STEP selector switch is not provided.

(FM)

| MODEL | BAND STEP    | D717, J753 | R119      |
|-------|--------------|------------|-----------|
| UD    | 200kHz→50kHz | Additional | 15kΩ→24kΩ |
| UG/UQ | 50kHz→200kHz | Eliminated | 24kΩ→15kΩ |

(AM)

| BAND STEP   | D716, J754 |
|-------------|------------|
| 10kHz→ 9kHz | Additional |
| 9kHz→10kHz  | Eliminated |

In D716/7 1SS133 (Part No. 223163) is used. In J753/4, a jumper lead must be inserted. R119, with the muting amplitude determined, is on the back panel side of FM/AM tuner and selector circuit printed circuit board assembly test points TP-1 and TP-2.

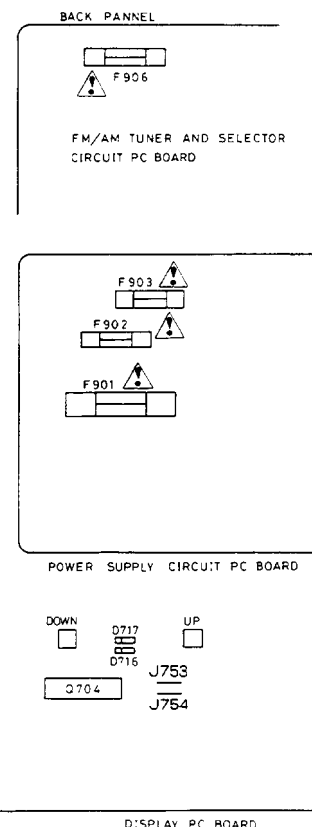
– Worldwide model –

Worldwide models are equipped with a step band selector switch. This switch is located on the back panel. This switch is set to 50kHz (FM) and 9kHz (AM) at the factory, but may have to be reset to 200kHz and 10kHz depending on the area where the unit is used.

|         | De-emphasis | FM step | AM step |
|---------|-------------|---------|---------|
| Europe: | 50 μsec     | 50kHz   | 9kHz    |
| U.S.A.: | 75 μsec     | 200kHz  | 10kHz   |

### 3. Memory preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in



and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory the power switch must be turned on and off a few times each month to keep the back-up system operative. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

### 4. Safety-check out

(Only U.S.A. model)

After correcting the original service problem perform the following safety check before releasing the set to the customer.

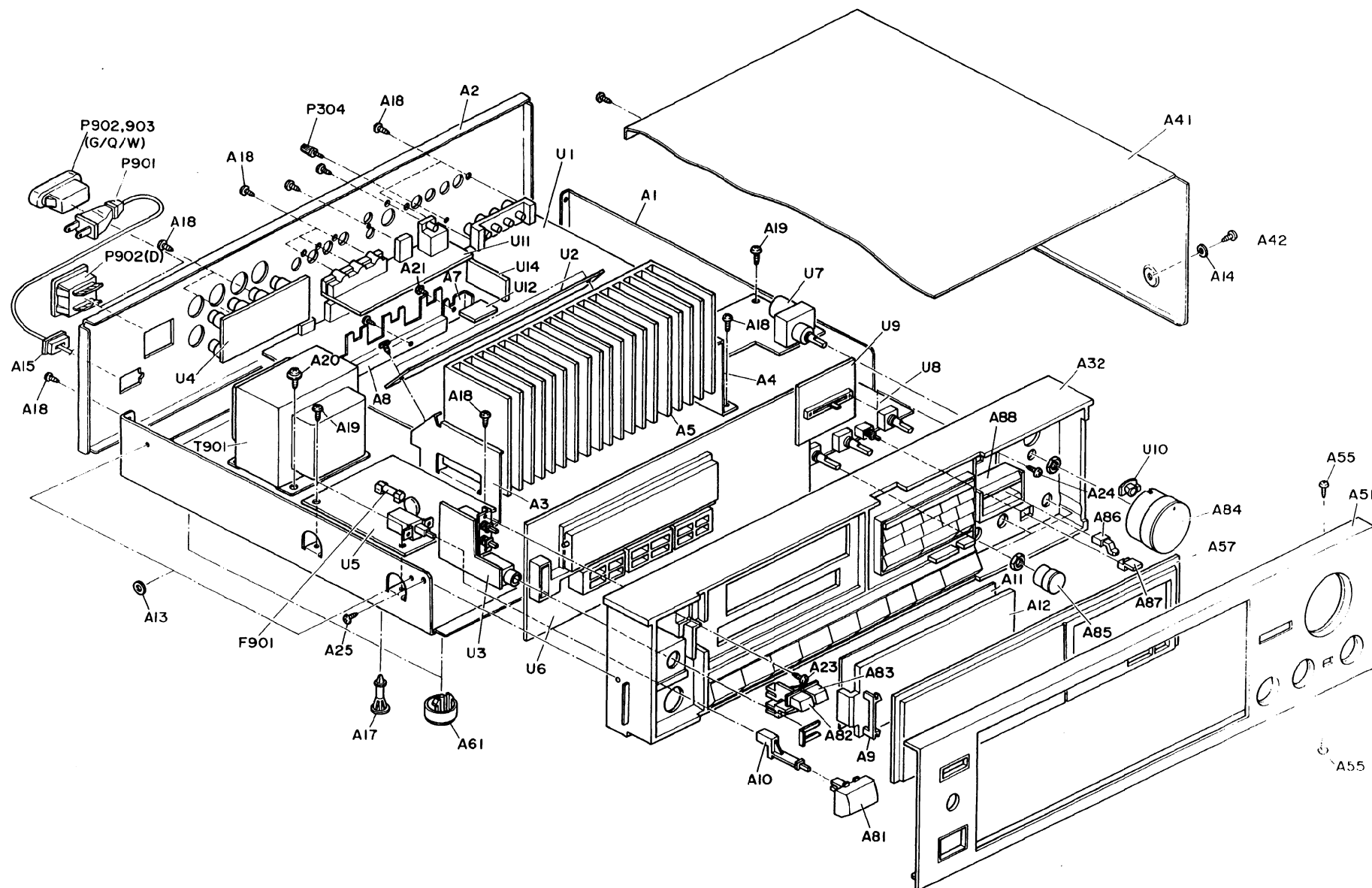
Connect the insulating-resistance tester between the plug of power supply cord and terminal GND on the back panel. Specifications: 3.3 Mohm ±10% at 500V.

### 5. Change of voltage

Worldwide models are equipped with a voltage selector to conform with local power supplies. This switch is located on the back panel. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

This switch is set to 220V at the factory. Voltage is changed by sliding the groove in the switch with the screw-driver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.

# EXPLODED VIEW



# PARTS LIST

| REF. NO. | PART NO.  | DESCRIPTION                        |
|----------|-----------|------------------------------------|
| A1       | 27100163  | Chassis                            |
| A2       | 27121112  | Back panel <D>                     |
|          | 27121113  | Back panel <G>                     |
|          | 27121115  | Back panel <W>                     |
|          | 27121116  | Back panel <Q>                     |
| A3       | 27141261A | Bracket LH                         |
| A4       | 27141262  | Bracket RH                         |
| A5       | 27160226A | Radiator                           |
| A7       | 27141263  | Bracket SH                         |
| A8       | 27141264  | Bracket H                          |
| A9       | 27190644  | Holder,dial plate                  |
| A10      | 27273098A | Joint,power                        |
| A11      | 28133199A | Back plate                         |
| A12      | 28130250  | Dial plate                         |
| A13      | 27270147  | Spacer                             |
| A14      | 870048    | 3×8×0.8t,Nylon washer              |
| A15      | 27300750  | △ Strainrelief                     |
| A17      | 27190524  | Holder                             |
| A18      | 834430088 | 3TTS+8B(BC),Tapping screw          |
| A19      | 831130088 | 3TTW+8B,Tapping screw              |
| A20      | 830440089 | 4TTC+8C(BC),Tapping screw          |
| A21      | 834430108 | 3TTS+10B(BC),Tapping screw         |
| A22      | 834230108 | 3TTS+10B(Ni),Nickel screw          |
| A23      | 82143006  | 3P+6FN(BC),Pan head screw          |
| A24      | 82142004  | 2P+4F(BC),Pan head screw           |
| A25      | 833430080 | 3TTP+8P(BC),Tapping screw          |
| A32      | 27110418A | Front bracket ass'y                |
| A41      | 28184394  | Top cover                          |
| A42      | 834430088 | 3TTS+8B(BC),Tapping screw          |
| A43      | 801230    | 3STS+8BQ(BC),Tapping screw         |
| A51      | 1A096121  | Front panel ass'y                  |
| A55      | 833430080 | 3TTP+8P(BC),Tapping screw          |
| A57      | 28191466A | Clear plate                        |
| A61      | 27175142  | Leg                                |
| A81      | 28323241  | Knob POWER                         |
| A82      | 28323361  | Knob SPEAKER A                     |
| A83      | 28323363  | Knob SPEAKER B                     |
| A84      | 28323365A | Knob VOLUME                        |
| A85      | 28323310  | Knob TONE                          |
| A86      | 28322925  | Knob SLIDE                         |
| A87      | 28323367  | Knob PUSH                          |
| A88      | 27190647  | Knob SLIDE                         |
| F901     | 252050    | △ 5A(ST-6),Primary fuse <D/W>      |
| F902     | 252075    | △ 2.5A-SE-EAK,Primary fuse <G/W/Q> |
| F903     | 252075    | △ 2.5A-SE-EAK,AC outlet fuse <G>   |
| F906     | 252070    | △ 1A-SE-EAK,Secondary fuse <G/Q>   |

| REF. NO.  | PART NO.    | DESCRIPTION                                                         |
|-----------|-------------|---------------------------------------------------------------------|
| P304      | 25060044    | 3×14mm,Terminal GND                                                 |
| P901      | 253123,     | △ AS-UC-6 # 18,Power supply cord                                    |
|           | 253136,     | <D>                                                                 |
|           | 253140 or   |                                                                     |
|           | 253146      |                                                                     |
|           | 253148 or   | △ AS-CEE,Power supply cord <G/W>                                    |
|           | 253150      |                                                                     |
|           | 253118      | △ AS-SAA,Power supply cord <Q>                                      |
| P902      | 25050341    | △ NSCT-4P168T,AC outlet <D>                                         |
| P902,P903 | 25050337    | △ NSCT-2P164,AC outlet <G/W>                                        |
| Q521,Q522 | 2501703,    | 2SC3855(O),                                                         |
|           | 2201704 or  | 2SC3855(Y) or                                                       |
|           | 2201706     | 2SC3855(P),Power amplifier transistor                               |
| Q523,Q524 | 2201693,    | 2SA1491(O),                                                         |
|           | 2201694 or  | 2SA1491(Y) or                                                       |
|           | 2201696     | 2SA1491(P),Power amplifier transistor                               |
| S903      | 25065123    | △ NPS-1258P,Voltage selector switch <W>                             |
| T901      | 2300306     | △ NPT-993D,Power transformer <D>                                    |
|           | 2300307     | △ NPT-993G,Power transformer <G>                                    |
|           | 2300308     | △ NPT-993DG,Power transformer <W>                                   |
|           | 2300340     | △ NPT-993Q,Power transformer <Q>                                    |
| U1        | 1A095576-2  | NAAR-3276-2,FM/AM tuner and selector circuit pc board' ass'y <D>    |
|           | 1A095576-2A | NAAR-3276-2A, FM/AM tuner and selector circuit pc board ass'y <G/Q> |
|           | 1A096576-2B | NAAR-3276-2B, FM/AM tuner and selector circuit pc board ass'y <W>   |
| U2        | 1A095577-2  | NAAF-3277-2,Power amplifier pc board ass'y                          |
| U3        | 1A095578-2  | NASW-3278-2,Speaker switch pc board ass'y <D/W>                     |
|           | 1A095578-2A | NASW-3278-2A, Speaker switch pc board ass'y <G/Q>                   |
| U4        | 1A090579-1  | NAETC-3279-1,Speaker terminal pc board ass'y <D>                    |
|           | 1A090579-1A | NAETC-3279-1A, Speaker terminal pc board ass'y <G/W/Q>              |
| U5        | 1A090580-1  | NAETC-3280-1,Const. voltage circuit pc board ass'y                  |

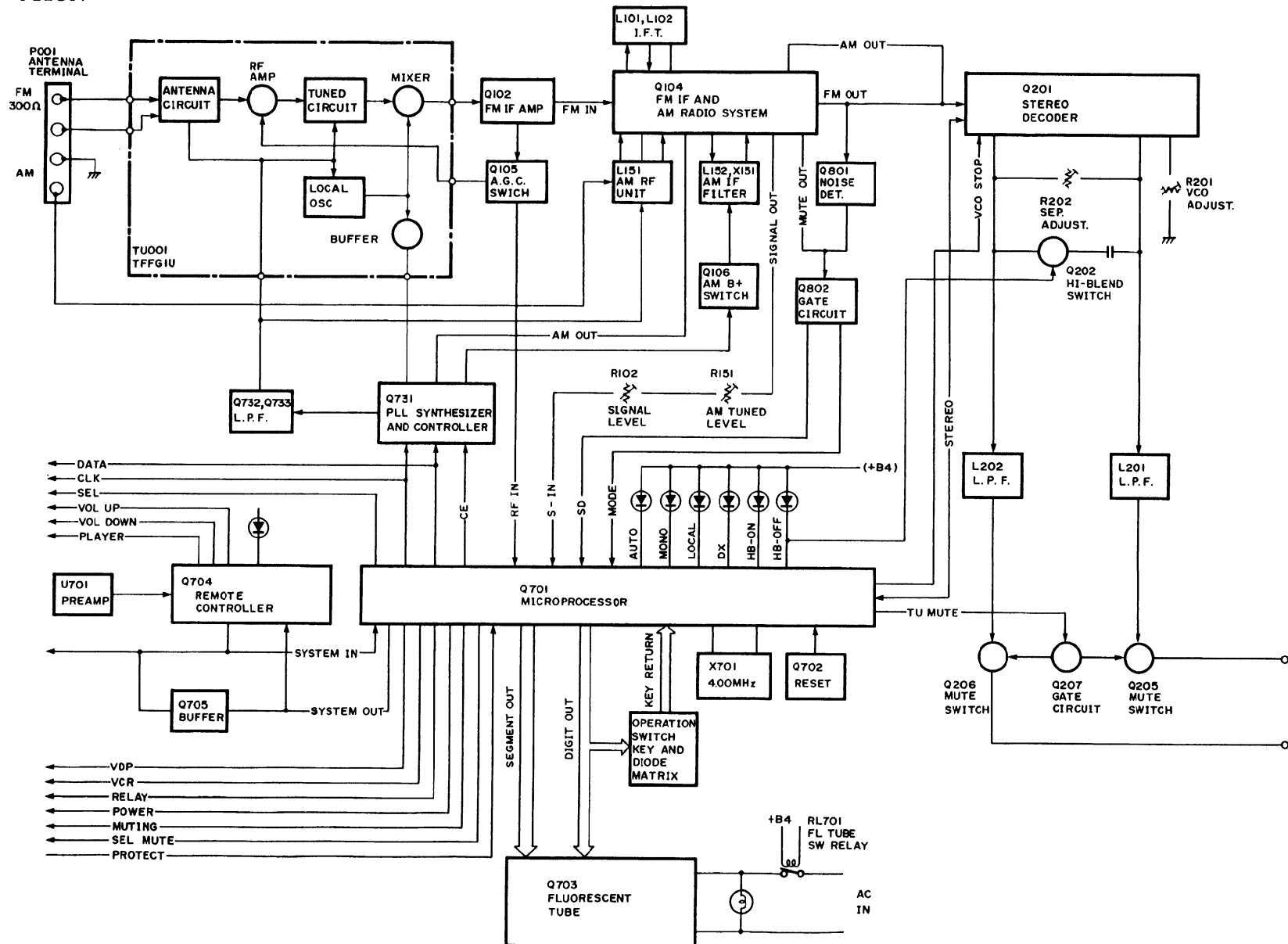
| REF. NO. | PART NO.    | DESCRIPTION                                            |
|----------|-------------|--------------------------------------------------------|
| U6       | 1A095581-2  | NADIS-3281-2,Display pc board ass'y <D>                |
|          | 1A095581-2A | NADIS-3281-2A, Display pc board ass'y <G/Q>            |
|          | 1A096581-2B | NADIS-3281-2B, Display pc board ass'y <W>              |
| U7       | 1A090582-1  | NAAF-3282-1,Volume pc board ass'y <D>                  |
|          | 1A090582-1A | NAAF-3282-1A, Volume pc board ass'y <G/W/Q>            |
| U8       | 1A095583-2  | NAAF-3283-2,Preamplifier pc board ass'y <D>            |
|          | 1A095583-2A | NAAF-3283-2A, Preamplifier pc board ass'y <G/W/Q>      |
| U9       | 1A095584-2  | NAAF-3284-2,Switch pc board ass'y                      |
| U10      | 1A090585-1  | NADIS-3285-1,Volume indicator pc board ass'y           |
| U11      | 1A090586-1  | NAETC-3286-1,Video terminal pc board ass'y <D>         |
|          | 1A090586-1A | NAETC-3286-1A, Video terminal pc board ass'y <G/W/Q>   |
| U12      | 1A090587-1  | NAPS-3287-1,Power supply circuit pc board ass'y <D>    |
|          | 1A090587-1A | NAPS-3287-1A,Power supply circuit pc board ass'y <G>   |
|          | 1A091587-1B | NAPS-3287-1B,Power supply circuit pc board ass'y <W>   |
|          | 1A091587-1C | NAPS-3287-1C,Power supply circuit pc board ass'y <Q>   |
| U14      | 1A073554-2  | NAAF-3054-2,Equalizer amplifier pc board ass'y <D>     |
|          | 1A086554-3  | NAAF-3054-3,Equalizer amplifier pc board ass'y <G/W/Q> |

NOTE: <D>: Only 120V model  
<G>: Only 220V model  
<W>: Only Worldwide model  
<Q>: Only 240V model

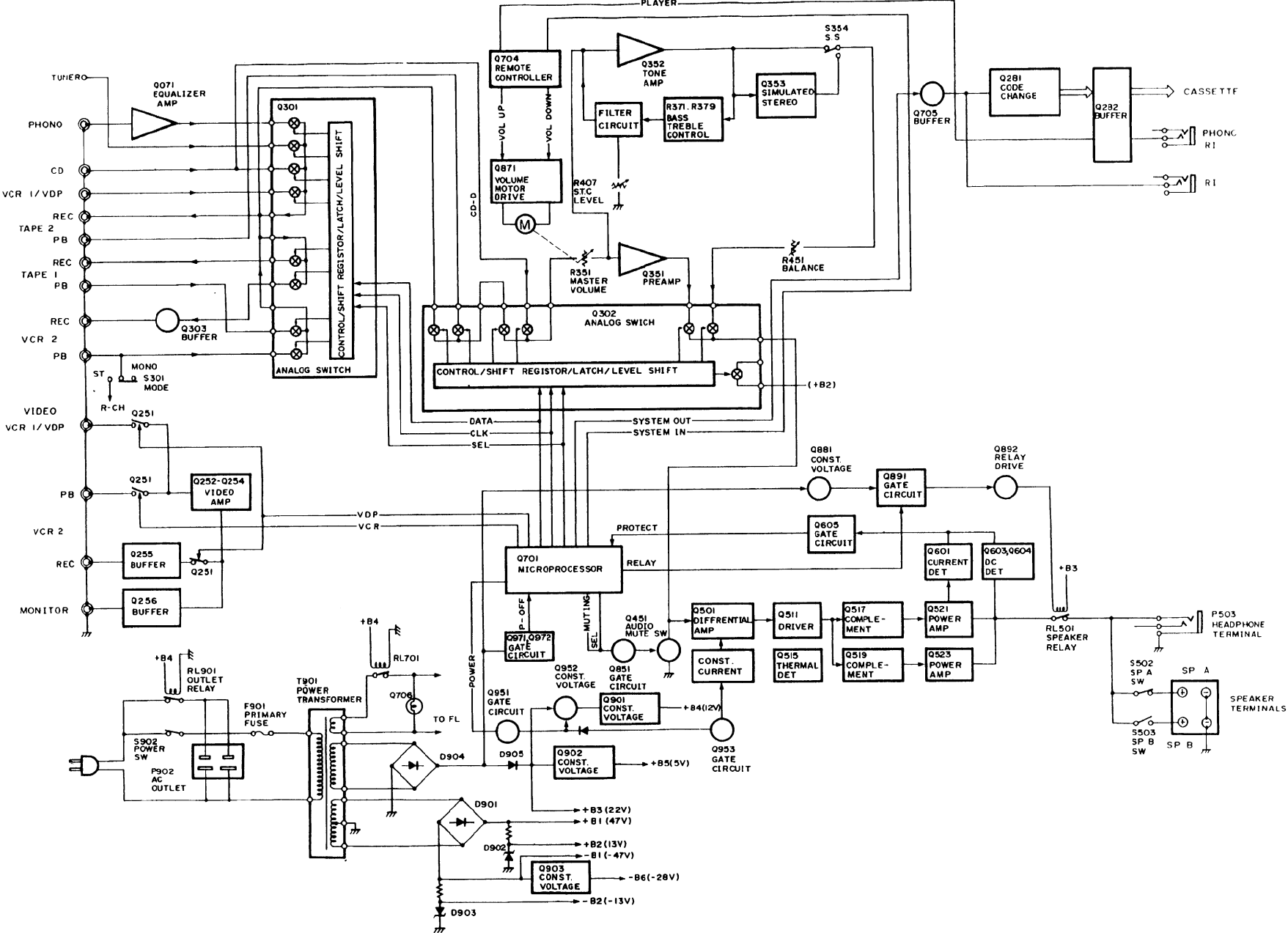
NOTE: THE COMPONENTS IDENTIFIED BY MARK△ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

# BLOCK DIAGRAM

—120V MODEL—  
TUNER SECTION

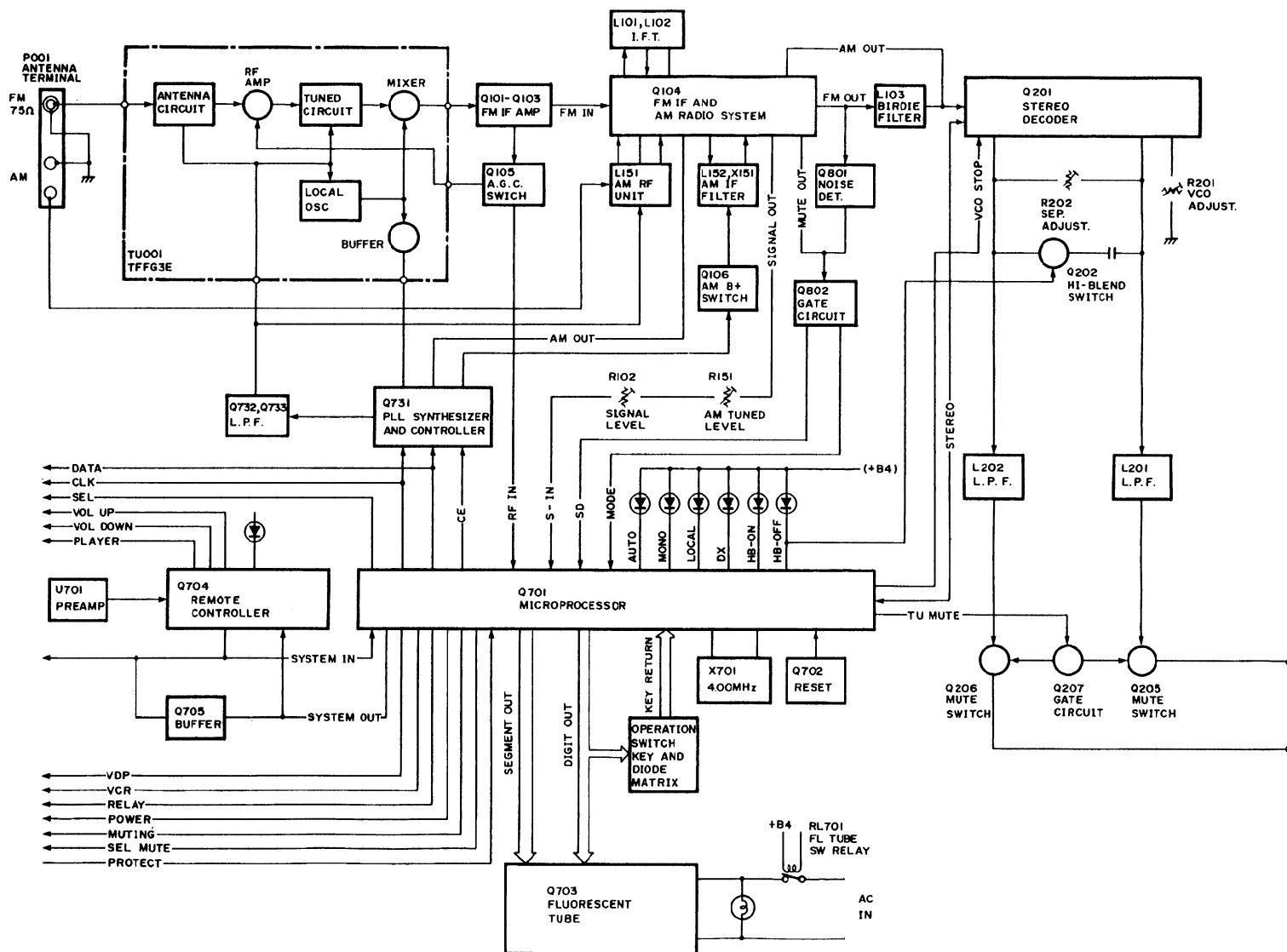


AMPLIFIER SECTION

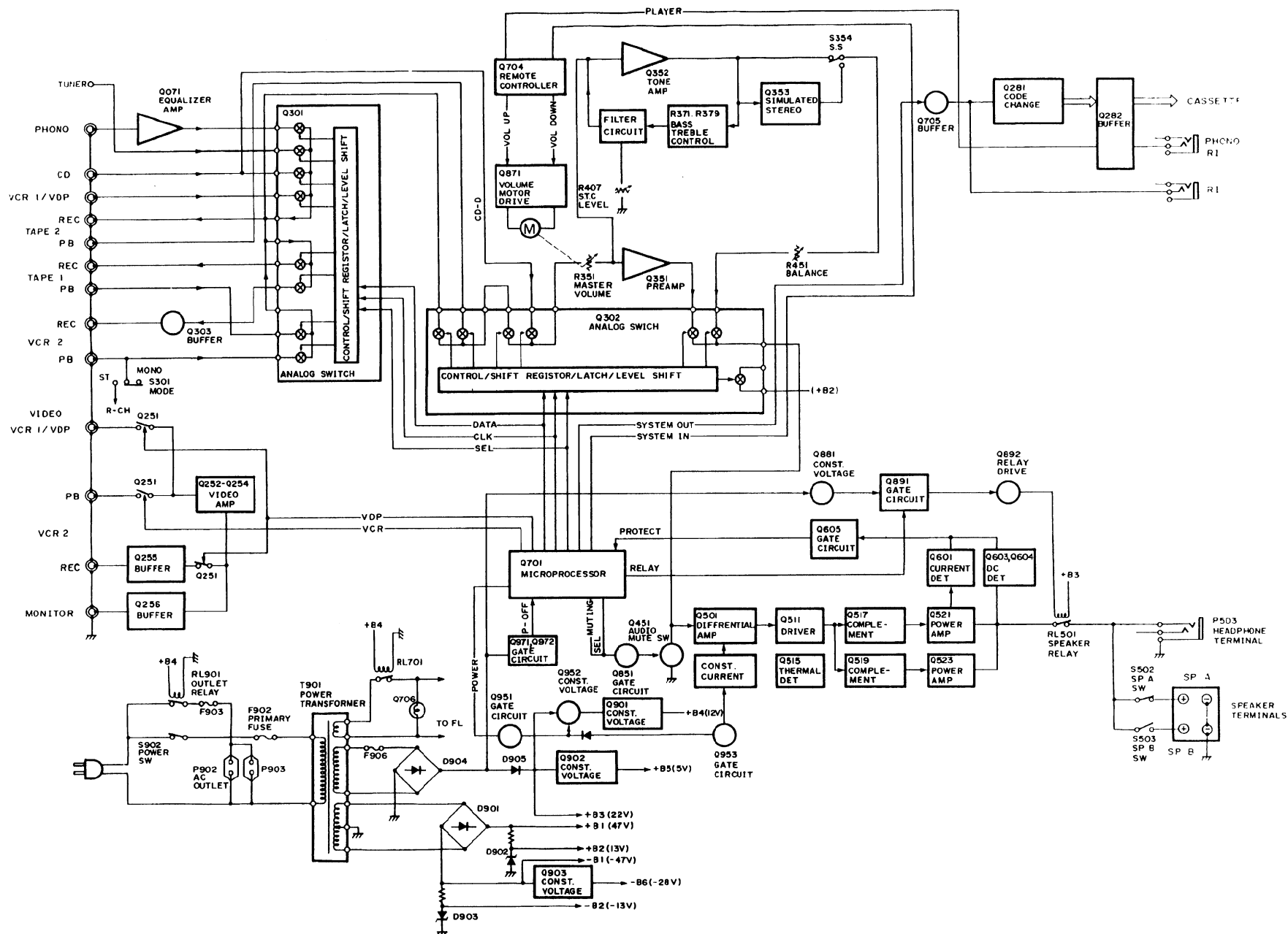


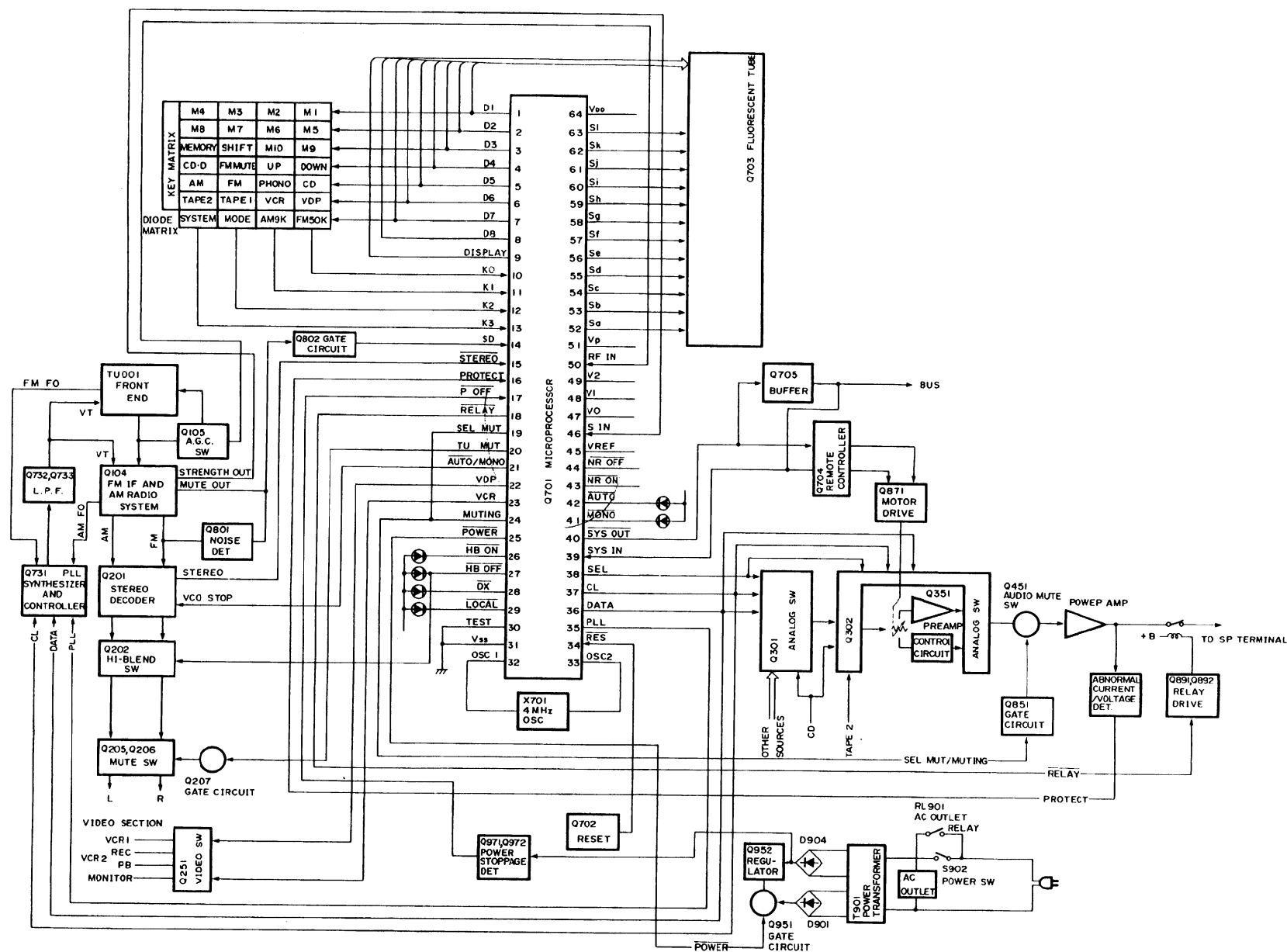
# BLOCK DIAGRAM

—OTHER MODELS—  
TUNER SECTION



# AMPLIFIER SECTION





# BLOCK DIAGRAM OF ICS

## LC6568H-3643 (MICROPROCESSOR)

### Terminal Descriptions

| Pin No. | Terminal   | Description                                                                                                                        |
|---------|------------|------------------------------------------------------------------------------------------------------------------------------------|
| 1       | D1         | These are the digit and key scan signal terminals.<br>"H" when active.                                                             |
| 2       | D2         |                                                                                                                                    |
| 3       | D3         |                                                                                                                                    |
| 4       | D4         |                                                                                                                                    |
| 5       | D5         |                                                                                                                                    |
| 6       | D6         |                                                                                                                                    |
| 7       | D7         |                                                                                                                                    |
| 8       | D8         |                                                                                                                                    |
| 9       | DISPLAY    | Display output terminal."H" when active.                                                                                           |
| 10      | K0         | These are the input terminal for key return signal<br>source and diode matrix."H" when active.                                     |
| 11      | K1         |                                                                                                                                    |
| 12      | K2         |                                                                                                                                    |
| 13      | K3         |                                                                                                                                    |
| 14      | SD         | Auto stop signal input terminal.Auto tuning stops when this terminal becomes the high level.                                       |
| 15      | STEREO     | This is the input terminal for detection of the stereo broadcast."L" when active.                                                  |
| 16      | PROTECT    | This is the detection terminal for protection circuit.The speaker relay turns off when this terminal becomes the high level.       |
| 17      | POWER OFF  | This is the input terminal for detection of the stoppage of electric current."L" when the stoppage of electric current.            |
| 18      | RELAY      | This is the output terminal for control of the speaker relay."L" when active.                                                      |
| 19      | SEL MUTE   | This is the muting output terminal when the selector key is operated."H" when active.                                              |
| 20      | TU MUTE    | This is the output terminal for muting control of tuner section."L" when active.                                                   |
| 21      | AUTO/MONO  | This is the AUTO/MONO switching output terminal. "L" when AUTO.                                                                    |
| 22      | VDP        | These are the output terminal for control of video signal.                                                                         |
| 23      | VCR        |                                                                                                                                    |
| 24      | MUTING     | This is the output terminal for muting control. "H" when active.                                                                   |
| 25      | POWER      | This is the output terminal for power source.It is "H" for power on.                                                               |
| 26      | HB ON      | This is the output terminal for indication of HI-BLEND ON. "L" when active.                                                        |
| 27      | HB OFF     | This is the output terminal for indication of HI-BLEND OFF. "L" when active.                                                       |
| 28      | DX         | This is the output terminal for indication of DX. "L" when active.                                                                 |
| 29      | LOCAL      | This is the output terminal for indication of LOCAL. "L" when active.                                                              |
| 30      | TEST       | Test terminal.Connect to the ground.                                                                                               |
| 31      | Vss        | Ground terminal.                                                                                                                   |
| 32      | OSC1       | Connect to the 4.00MHz ceramic oscillator.                                                                                         |
| 33      | OSC2       |                                                                                                                                    |
| 34      | RES        | This is the input terminal for reset. "L" when active                                                                              |
| 35      | PLL        | Connect to the terminal CE of PLL IC(LM7001).                                                                                      |
| 36      | DATA       | This is the serial data output terminal.Connect to the terminal DATA of PLL IC and terminal DI of analog switches. (LC7821/LC7823) |
| 37      | CLOCK      | This is the serial clock output terminal.Connect to the terminal CI of PLL IC and terminal CL of analog switches.                  |
| 38      | SEL        | Connect to terminal SEL of analog switch(LC7821).                                                                                  |
| 39      | SYSTEM IN  | This is the input terminal for system code. "H" when active.                                                                       |
| 40      | SYSTEM OUT | This is the input terminal for system code. "L" when active.                                                                       |
| 41      | MONO       | This is the output terminal for indication of MONO. "L" when active.                                                               |
| 42      | AUTO       | This is the output terminal for indication of AUTO. "L" when active.                                                               |
| 43      | NR ON      | This is the output terminal for indication of NR ON. "L" when active.                                                              |
| 44      | NR OFF     | This is the output terminal for indication of NR OFF. "L" when active.                                                             |
| 45      | VREF       | This is the input terminal for comparator reference voltage.                                                                       |
| 46      | S IN       | This is the signal strength input terminal.                                                                                        |
| 47      | V0         | This is the output terminal for comparator reference voltage.                                                                      |
| 48      | V1         | This is the output terminal for comparator reference voltage.                                                                      |
| 49      | V2         | This is the output terminal for comparator reference voltage.                                                                      |
| 50      | RF IN      | This is the input terminal for control of AGC. "H" when active.                                                                    |
| 51      | VP         | Pull-down resistor connection terminal of FIP controller/driver.                                                                   |

| Pin No. | Terminal | Description                                                                                                                                                         |
|---------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 52      | Sa       | These are the output terminal for segment signal.<br>"H" when active.                                                                                               |
| 53      | Sb       |                                                                                                                                                                     |
| 54      | Sc       |                                                                                                                                                                     |
| 55      | Sd       |                                                                                                                                                                     |
| 56      | Se       |                                                                                                                                                                     |
| 57      | Sf       |                                                                                                                                                                     |
| 58      | Sg       |                                                                                                                                                                     |
| 59      | Sh       |                                                                                                                                                                     |
| 60      | Si       |                                                                                                                                                                     |
| 61      | Sj       |                                                                                                                                                                     |
| 62      | Sk       |                                                                                                                                                                     |
| 63      | Sl       |                                                                                                                                                                     |
| 64      | VDD      | This is the device power source terminal. At the time of operation, the supply is 5V. The internal data memory (RAM) is maintained by means of the super capacitor. |

**FM50K (FM band setting)**

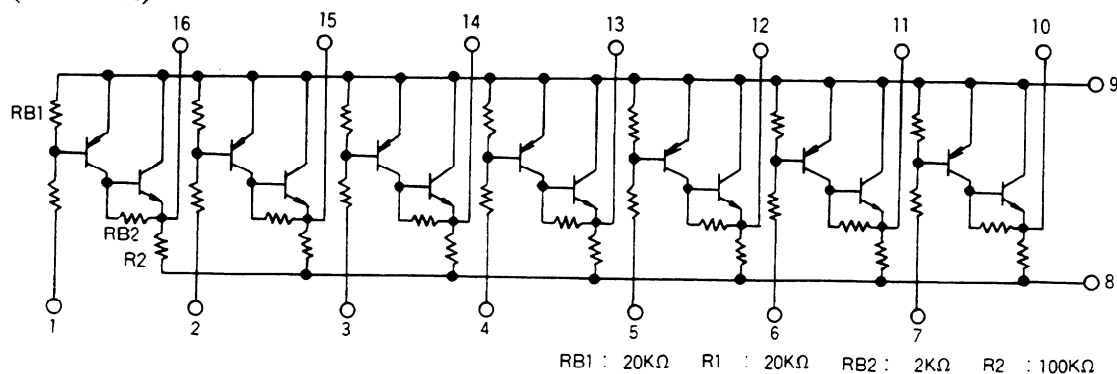
| FM50K | Region  | Frequency range   | Channel space | Reference frequency | IF frequency |
|-------|---------|-------------------|---------------|---------------------|--------------|
| 1     | Europen | 87.50 ~ 108.00MHz | 50kHz         | 25kHz               | 10.7MHz      |
| 0     | U.S.A.  | 87.9 ~ 107.9MHz   | 200kHz        | 25kHz               | 10.7MHz      |

**AM9**

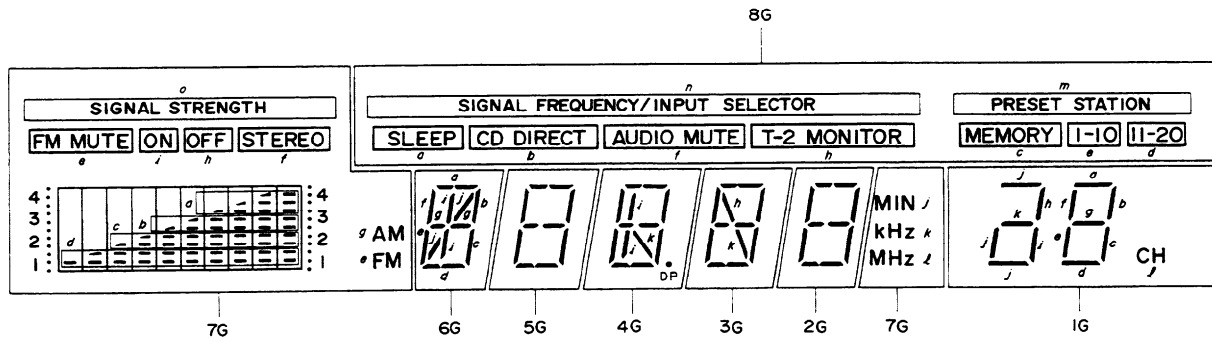
| AM9K | Region  | Frequency range | Channel space | Reference frequency | IF frequency |
|------|---------|-----------------|---------------|---------------------|--------------|
| 1    | Europen | 522 ~ 1611 kHz  | 9kHz          | 9kHz                | 450kHz       |
| 0    | U.S.A.  | 530 ~ 1620 kHz  | 10kHz         | 10kHz               | 450kHz       |

**Connection of fluorescent tube and microprocessor****ANODE CONNECTION**

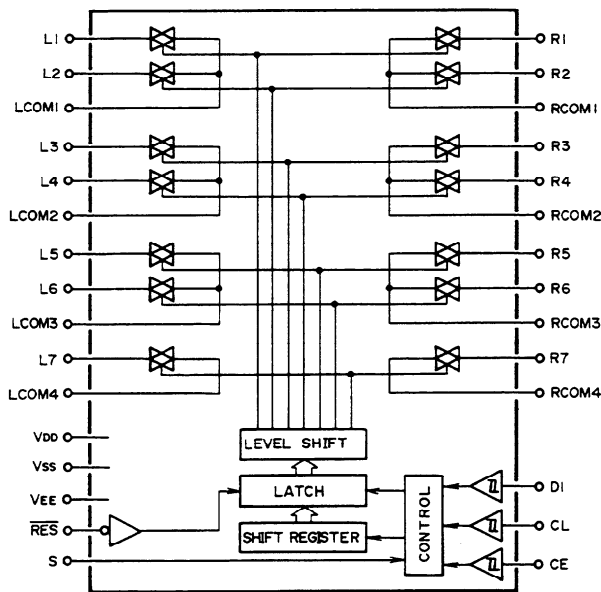
|   | 8 G (D 8)                       | 7 G (D 7)       | 6 G (D 6) | 5 G (D 5) | 4 G (D 4) | 3 G (D 3) | 2 G (D 2) | 1 G (D 1) |
|---|---------------------------------|-----------------|-----------|-----------|-----------|-----------|-----------|-----------|
| a | SLEEP                           |                 | a         | a         | a         | a         | a         | a         |
| b | CD DIRECT                       |                 | b         | b         | b         | b         | b         | b         |
| c | MEMORY                          |                 | c         | c         | c         | c         | c         | c         |
| d | 11-20                           |                 | d         | d         | d         | d         | d         | d         |
| e | 1-10                            | FM FM MUTE      | e         | e         | e         | e         | e         | e         |
| f | AUDIO MUTE                      | STEREO          | f         | f         | f         | f         | f         | f         |
| g | -                               | AM              | g         | g         | g         | g         | g         | g         |
| h | T-2 MONITOR                     | OFF             | -         | -         | -         | h         | -         | h         |
| i | -                               | ON              | i         | -         | i         | -         | -         | i         |
| j | -                               | MIN             | j         | -         | -         | -         | -         | j         |
| k | -                               | kHz             | -         | -         | k         | k         | -         | k         |
| l | -                               | MHZ             | -         | -         | DP        | -         | -         | CH        |
| m | PRESET STATION                  | -               | -         | -         | -         | -         | -         | -         |
| n | SIGNAL FREQUENCY INPUT SELECTOR | -               | -         | -         | -         | -         | -         | -         |
| o | -                               | SIGNAL STRENGTH | -         | -         | -         | -         | -         | -         |
| p | -                               |                 | -         | -         | -         | -         | -         | -         |

**μPA81C (BUFFER)**

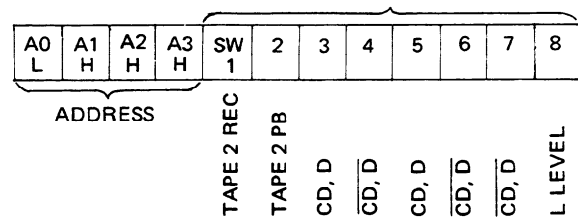
## 7-BT-95GK (FLUORESCENT TUBE)



## LC7823 (ANALOG SWITCH)



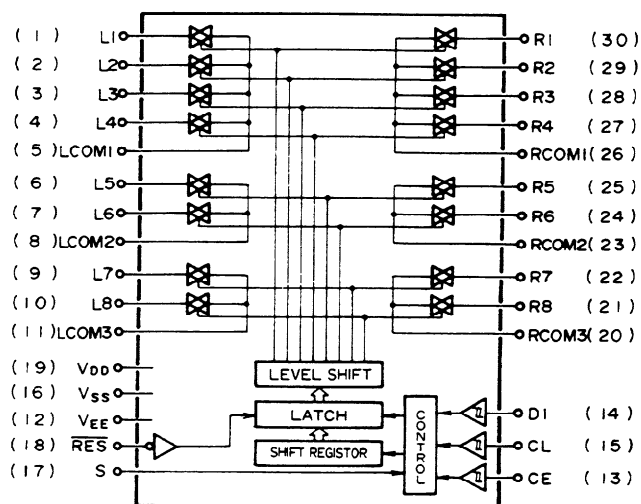
## DATA composition



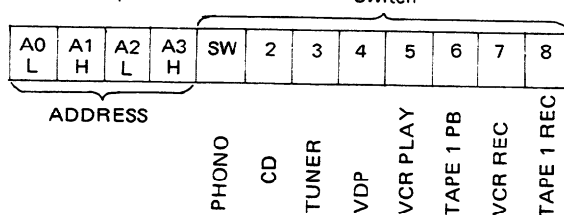
The source becomes ON when the bit of switch becomes high.

| Pin No. | Terminal   | Description                                                                                                        | Pin No. | Terminal   | Description                                                                                                                                                |
|---------|------------|--------------------------------------------------------------------------------------------------------------------|---------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 (L1)  | TAPE 2 REC | Input/output terminals of audio signal of left channel.<br>Control to the inside analog switch at the serial data. | 16      | Vss        | Ground terminal.                                                                                                                                           |
| 2 (L2)  | TAPE 2 PB  |                                                                                                                    | 17      | S          | Selector terminal.                                                                                                                                         |
| 3       | L COM 1    |                                                                                                                    | 18      | RES        | Reset terminal. When power is turned ON, the condition of the analog switch is not determined, but when this terminal is "L", all analog switches are OFF. |
| 4 (L3)  | CD·D       |                                                                                                                    | 19      | VDD        | Power supply terminal. (+15V)                                                                                                                              |
| 5 (L4)  | CD·D       |                                                                                                                    | 20      | R COM 4    | Input/output terminals of audio signal of right channel.<br>Control to the inside analog switch at the serial data.                                        |
| 6       | L COM 2    |                                                                                                                    | 21 (R7) | CD·D       |                                                                                                                                                            |
| 7 (L5)  | CD·D       |                                                                                                                    | 22      | R COM 3    |                                                                                                                                                            |
| 8 (L6)  | CD·D       |                                                                                                                    | 23 (R6) | CD·D       |                                                                                                                                                            |
| 9       | L COM 3    |                                                                                                                    | 24 (R5) | CD·D       |                                                                                                                                                            |
| 10 (L7) | CD·D       |                                                                                                                    | 25      | R COM 2    |                                                                                                                                                            |
| 11      | L COM 4    |                                                                                                                    | 26 (R4) | CD·D       |                                                                                                                                                            |
| 12      | VEE        | Negative power supply terminal. (-15V)                                                                             | 27 (R3) | CD·D       |                                                                                                                                                            |
| 13      | CE         | Chip enable terminal. Connect to SEL terminal of LC6568H-3643.                                                     | 28      | R COM 1    |                                                                                                                                                            |
| 14      | D1         | Serial data input terminal. Connect to DATA terminal of LC6868H-3643.                                              | 29 (R2) | TAPE 2 PB  |                                                                                                                                                            |
| 15      | CL         | Serial clock input terminal. Connect to CLOCK terminal of LC6868H-3643.                                            | 30 (R1) | TAPE 2 REC |                                                                                                                                                            |

## LC7821 (Analog switch)

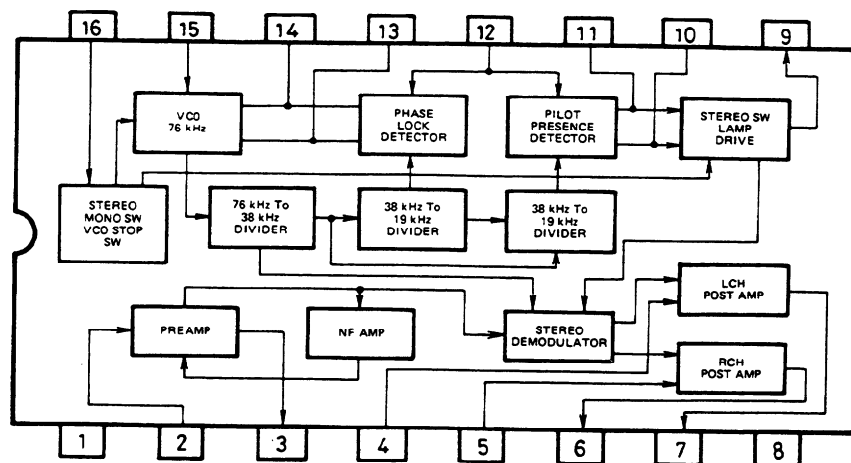


DATA composition

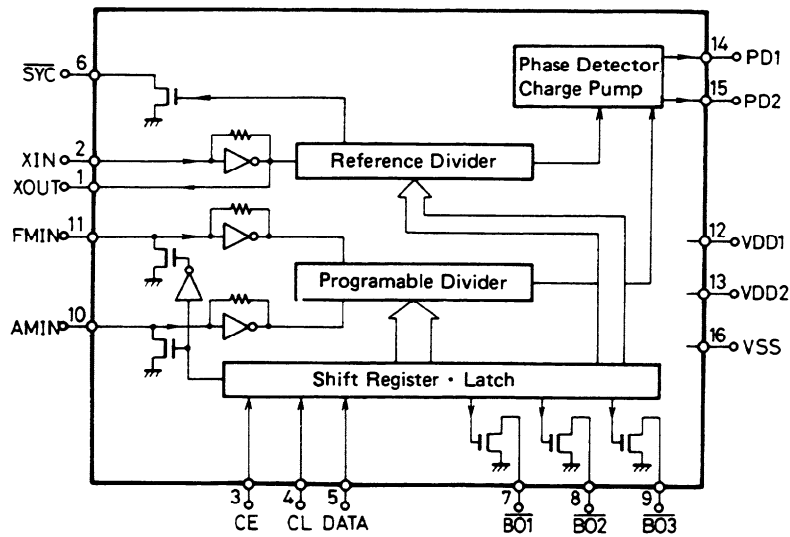


The source becomes ON when the bit of switch becomes high.

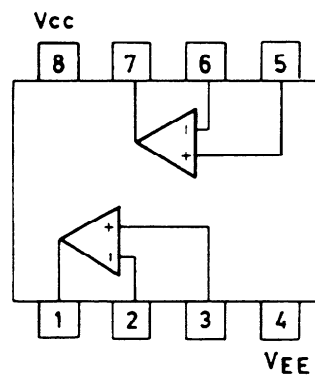
| Pin No. | Terminal   | Description                                                                                                     | Pin No. | Terminal   | Description                                                                                                                                                |
|---------|------------|-----------------------------------------------------------------------------------------------------------------|---------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | PHONO      | Input/output terminals of audio signal of left channel. Control to the inside analog switch at the serial data. | 16      | Vss        | Ground terminal.                                                                                                                                           |
| 2       | CD         |                                                                                                                 | 17      | S          | Selector terminal.                                                                                                                                         |
| 3       | TUNER      |                                                                                                                 | 18      | RES        | Reset terminal. When power is turned ON, the condition of the analog switch is not determined, but when this terminal is "L", all analog switches are OFF. |
| 4       | VDP        |                                                                                                                 | 19      | VDD        | Power supply terminal. (+15V)                                                                                                                              |
| 5       | L COM 1    |                                                                                                                 | 20      | R COM 3    | Input/output terminals of audio signal of right channel. Control to the inside analog switch at the serial data.                                           |
| 6       | VCR PB     |                                                                                                                 | 21      | TAPE 1 REC |                                                                                                                                                            |
| 7       | TAPE 1 PB  |                                                                                                                 | 22      | VCR REC    |                                                                                                                                                            |
| 8       | L COM 2    |                                                                                                                 | 23      | R COM 2    |                                                                                                                                                            |
| 9       | VCR REC    |                                                                                                                 | 24      | TAPE 1 PB  |                                                                                                                                                            |
| 10      | TAPE 1 REC |                                                                                                                 | 25      | VCR P      |                                                                                                                                                            |
| 11      | L COM 3    |                                                                                                                 | 26      | R COM 1    |                                                                                                                                                            |
| 12      | Vss        | Negative power supply terminal. (-15V)                                                                          | 27      | VDP        |                                                                                                                                                            |
| 13      | CE         | Chip enable terminal. Connect to SEL terminal of LC6568H-3643.                                                  | 28      | TUNER      |                                                                                                                                                            |
| 14      | D1         | Serial data input terminal. Connect to DATA terminal of LC6868H-3643.                                           | 29      | CD         |                                                                                                                                                            |
| 15      | CL         | Serial clock input terminal. Connect to CLOCK terminal of LC6868H-3643.                                         | 30      | PHONO      |                                                                                                                                                            |

 $\mu$ PC1161C3 (FM stereo decoder)

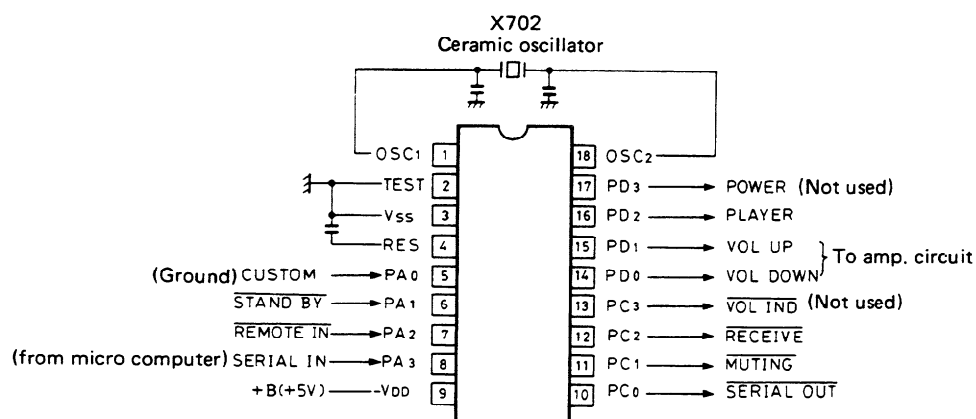
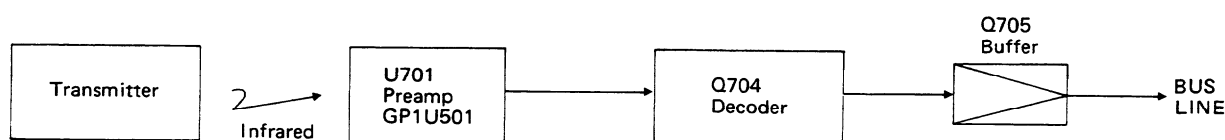
## LM7001 (PLL SYNTHESIZER AND CONTROLLER)



| Pin No. | Terminal | Description                                                                                                                                                                                          |
|---------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | XOUT     | Connect to the 7.2 MHz crystal oscillator.                                                                                                                                                           |
| 2       | XIN      |                                                                                                                                                                                                      |
| 3       | CE       | Chip enable terminal. Connect to the PLL terminal of LC6568H-3643.                                                                                                                                   |
| 4       | CL       | Serial clock input terminal. Connect to the CLOCK terminal of LC6568H-3643.                                                                                                                          |
| 5       | DATA     | Serial data input terminal. Connect to the DATA terminal of LC6568H-3643.                                                                                                                            |
| 6       | SYN      | Not used.                                                                                                                                                                                            |
| 7       | BO1      | Phono control signal output terminal. "L" when phono.                                                                                                                                                |
| 8       | BO2      | FM control signal output terminal. "L" when FM.                                                                                                                                                      |
| 9       | BO3      | AM control signal output terminal. "L" when AM.                                                                                                                                                      |
| 10      | AMIN     | AM local oscillator input terminal.                                                                                                                                                                  |
| 11      | FMIN     | FM local oscillator terminal.                                                                                                                                                                        |
| 12      | VDD 1    | Power supply terminal for back-up.                                                                                                                                                                   |
| 13      | VDD 2    | Power supply terminal.                                                                                                                                                                               |
| 14      | PD1      | Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided local oscillator frequency is high than the reference frequency.                           |
| 15      | PD2      | In the opposite case, low level is output. Floating occurs when the frequencies matched. The output is applied to the variable capacitor diode in the local oscillator through the low pass filters. |
| 16      | Vss      | Ground terminal.                                                                                                                                                                                     |

 $\mu$ PC4570C (OP AP)

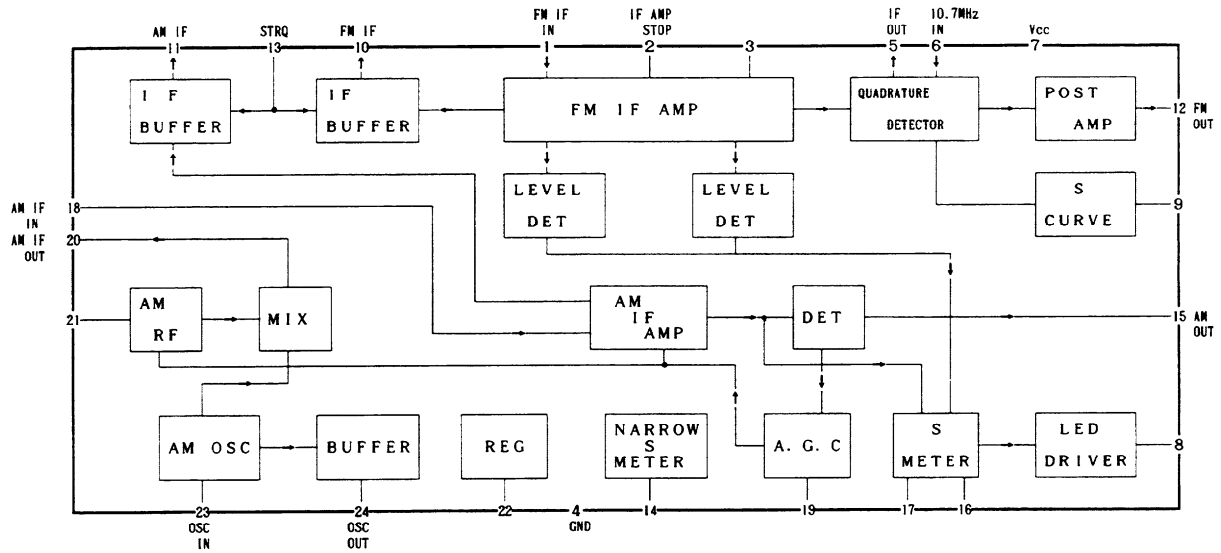
## LC6527C-3608 (REMOTE CONTROLLER)



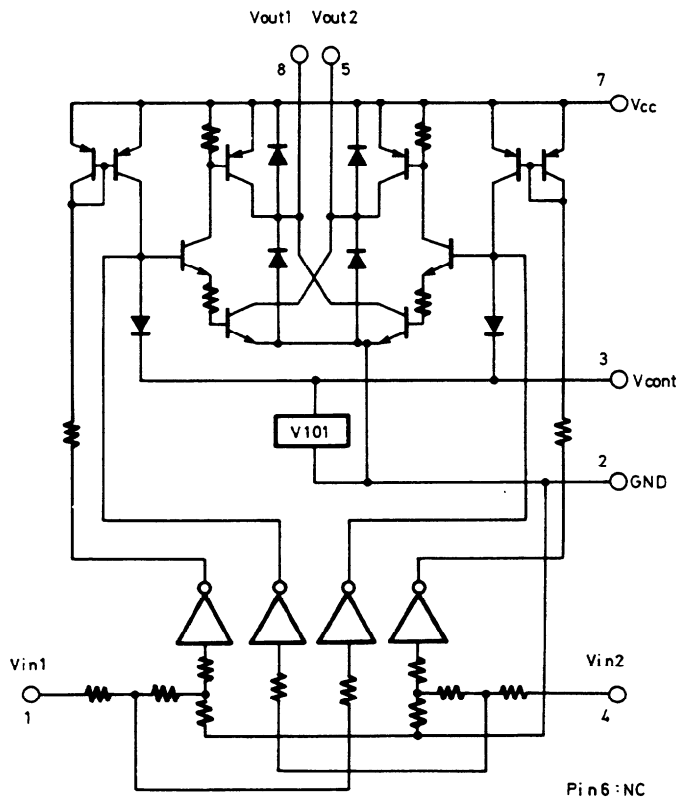
Connection diagram

| Terminal No. | Symbol       | Terminal   | Description                                                                                                                                                                                                          |
|--------------|--------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1<br>18      | OSC1<br>OSC2 | OSC        | Connect to the 1MHz ceramic oscillator.                                                                                                                                                                              |
| 2            | TEST         | TEST       | Test terminal. Connect to the ground.                                                                                                                                                                                |
| 3            | Vss          | GND        | Ground terminal.                                                                                                                                                                                                     |
| 4            | RES          | RES        | Reset terminal.                                                                                                                                                                                                      |
| 5            | PA0          | CUSTOM     | The custom code for decode is selected at this terminal. For U.S.A., the level is low.                                                                                                                               |
| 6            | PA1          | STANDBY    | Terminal for STANDBY detection. During low input, only the POWER code is decoded.                                                                                                                                    |
| 7            | PA2          | REMOTE IN  | Signal input terminal for remote control preamp. Active low.                                                                                                                                                         |
| 8            | PA3          | SERIAL IN  |                                                                                                                                                                                                                      |
| 9            | VDD          | +B         | Power supply terminal.                                                                                                                                                                                               |
| 10           | PC0          | SERIAL OUT | Output at this terminal are the custom code (16 bit) remote control code input to REMOTE IN, data code (8 bit), and the serial code (12 bit) that has been converted corresponding to the decoded data code (8 bit). |
| 11           | PC1          | MUTING     | At this terminal, the audio muting code that is input is inverted for each L/H. When power is ON, the level is high.                                                                                                 |
| 12           | PC2          | RECEIVE    | This is the display output for remote control reception. Output is low when decoded code is being received.                                                                                                          |
| 13           | PC3          | VOL IND    | During output of VOLUME UP/DOWN, a pulse ( $\overline{1}$ T $\overline{1}$ T; T = 0.3ms) is output.                                                                                                                  |
| 14           | PD0          | VOL DOWN   | When the volume DOWN code is input, a high pulse of 120ms is output.                                                                                                                                                 |
| 15           | PD1          | VOL UP     | When the volume UP code is input, a high pulse of 120ms is output.                                                                                                                                                   |
| 16           | PD2          | PLAYER     | When the player PLAY/REJECT is input, a high pulse of 200ms is output.                                                                                                                                               |
| 17           | PD3          | POWER      | The power code input inverts the L/H. Level is high for power being turned ON.                                                                                                                                       |

## LA1266 (FM IF AND AM RADIO SYSTEM)



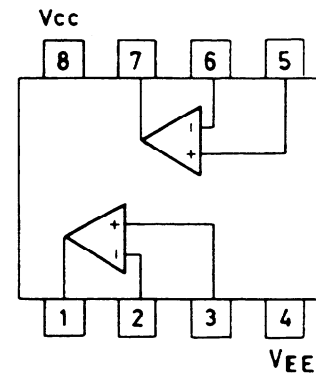
## LB1630 (MOTOR DRIVE)



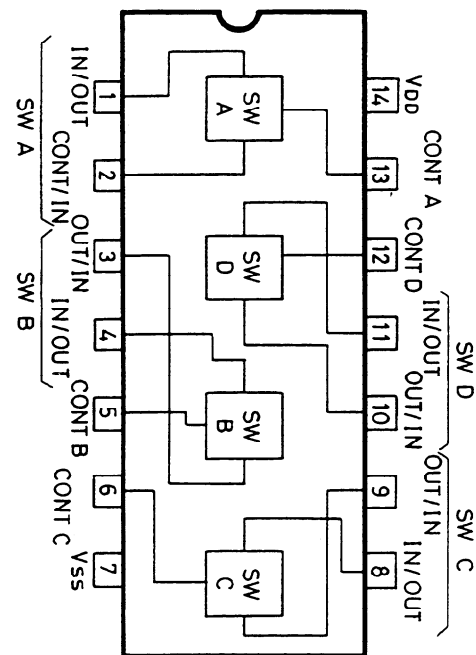
## TRUTH TABLE

| IN1 | IN2 | OUT1 | OUT2 | MOTOR   |
|-----|-----|------|------|---------|
| H   | L   | H    | L    | Normal  |
| L   | H   | L    | H    | Reverse |
| H   | H   | OFF  | OFF  | Wait    |
| L   | L   | OFF  | OFF  | Wait    |

## NJM-4558D/4560D/DX (OP AMP)



## 4066B (ANALOG SWITCH)



## ADJUSTMENT PROCEDURES

### Preparation

#### • Input

FM mono: 1kHz, 75kHz devi., 60dB/ $\mu$ V

FM stereo: 1kHz, L+R 67.5kHz devi.: Pilot signal 19kHz  
7.5kHz devi.

AM: 400Hz, 30% mod.,

#### • Output

Connect the non-inductive type resistor of 8 ohms to the speaker terminal A of left and right channels unless otherwise noted.

#### • Standard knob position

|                           |         |
|---------------------------|---------|
| TAPE MONITOR .....        | SOURCE  |
| VOLUME .....              | Maximum |
| BASS/TREBLE/BALANCE ..... | Center  |
| VCR 2 MODE .....          | STEREO  |
| SPEAKER .....             | A       |
| SIMULATED STEREO .....    | OFF     |

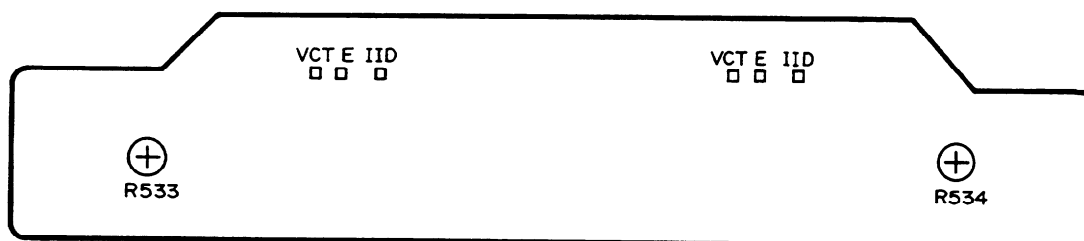
### Amplifier section

#### 1. Idling current adjustment

Connect the DC voltmeter to the terminals IID and VCT on the power amplifier pc board.

Adjust the semi-fixed resistors R533 and R534 so that the indication of voltmeter is  $7.5 \pm 1.5\text{mV}$ .

Notes: VOLUME ..... Maximum, Open load,  
Adjust after switching on for 5 minutes.



Power amplifier pc board

### FM section

| Item                   | Step | Connection of instrument | FM SG output                                   | Stereo modulator output               | Turning dial setting | Output indicator    | Adjustment          | Adjust for   | Remarks                                                                                |
|------------------------|------|--------------------------|------------------------------------------------|---------------------------------------|----------------------|---------------------|---------------------|--------------|----------------------------------------------------------------------------------------|
| FM IF                  | 1    | Fig. 1                   | 99.1MHz<br>1kHz, 75kHz devi.<br>65dBf (60dB)   | —                                     | 99.1MHz              | DC voltmeter        | L101                | 0V ± 20mV    | Mode switch: MONO<br>Repeat the steps 1 and 3 until no further adjustment is necessary |
|                        | 2    |                          |                                                |                                       |                      | AC voltmeter        | IF on the front end | Maximum      |                                                                                        |
|                        | 3    |                          |                                                |                                       |                      | Distortion analyzer | L102                | Minimum      |                                                                                        |
| Stereo indicator level | 1    | Fig. 3                   | 99.1MHz<br>17.2dBf (12dB)<br>Ext. modulation   | L + R : 1kHz<br>67.5kHz devi.         | 99.1MHz              | Stereo indicator    | R101                | Light on     | Mode switch: STEREO                                                                    |
|                        | 2    |                          | 99.1MHz<br>16.2dBf (11dB)<br>Ext. modulation   | Pilot signal<br>19kHz<br>7.5kHz devi. |                      |                     |                     | Light off    |                                                                                        |
| VCO                    |      | Fig. 2                   | 99.1MHz<br>1kHz, 75kHz devi.<br>65dBf (60dB)   | —                                     | 99.1MHz              | Frequency counter   | R201                | 19kHz ± 10Hz |                                                                                        |
| Stereo Distortion      |      | Fig. 3                   | 99.1MHz<br>65dBf (60dB)<br>Ext. modulation     | L or Rch. 1kHz                        | 99.1MHz              | Distortion analyzer | IF on the front end | Minimum      | Don't turn more than ± 180°.                                                           |
| Stereo Separation      | 1    | Fig. 3                   | 99.1MHz<br>65dBf (60dB)<br>Ext. modulation     | Lch. 1kHz                             | 99.1MHz              | Rch. AC voltmeter   | R202                | Minimum      | Maximum and same separation                                                            |
|                        | 2    |                          |                                                | Rch. 1kHz                             |                      | Lch. AC voltmeter   |                     | Minimum      |                                                                                        |
| Hi-blend level         |      | Fig. 3                   | 99.1MHz<br>35.2dBf (30dB)<br>1kHz, 75kHz devi. | —                                     | 99.1MHz              | Hi-blend indicator  | R102                | Light off    |                                                                                        |

### AM section

| Step | AM SG output                                    | Tuned frequency                | Output indicator       | Adjustment point | Adjust for      |
|------|-------------------------------------------------|--------------------------------|------------------------|------------------|-----------------|
| 1    |                                                 | 530kHz<br>[522kHz]<br>[531kHz] | Digital DC voltmeter   | OSC on RF block  | 1.3V $\pm$ 0.1V |
| 2    | 600kHz(603kHz)<br>400Hz 30% mod.<br>60dB/m      | 600kHz<br>(603kHz)             | AC voltmeter           | RF on RF block   | Maximum         |
| 3    | 1000kHz<br>(999kHz)<br>400Hz 30% mod.<br>60dB/m | 1000kHz<br>(999kHz)            | AC voltmeter           | L152             | Maximum         |
| 4    | Same as above                                   | 1000kHz<br>(999kHz)            | First signal indicator | R151             | Light on        |

### Reference specifications

FM Tuned voltage

87.9MHz  $2.0 \pm 0.5V$ 107.9MHz  $7.7 \pm 0.5V$ 

(120 V model)

87.5MHz  $2.0 \pm 0.5V$ 

108.0MHz 7.7 ± 0.5V

(Other models)

Auto stop level      AM: Less than 66dB/m

FM: Less than 17dB $\mu$

AM Tuned voltage

530kHz  $1.3 \pm 0.5V$ 1620kHz  $8.0 \pm 0.5V$ 

(120V model)

522kHz  $1.3 \pm 0.5V$ 1611kHz  $8.0 \pm 0.5V$ 

(Other models)

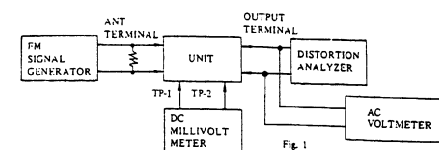
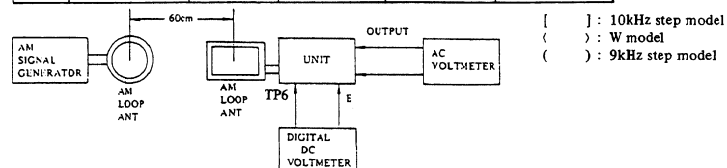
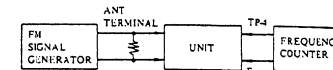


Fig. 1



Use the high impedance probe. (10:1)

Fig. 2

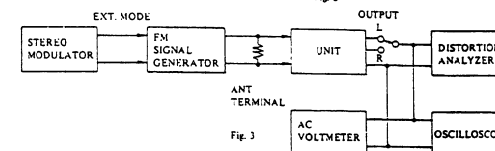
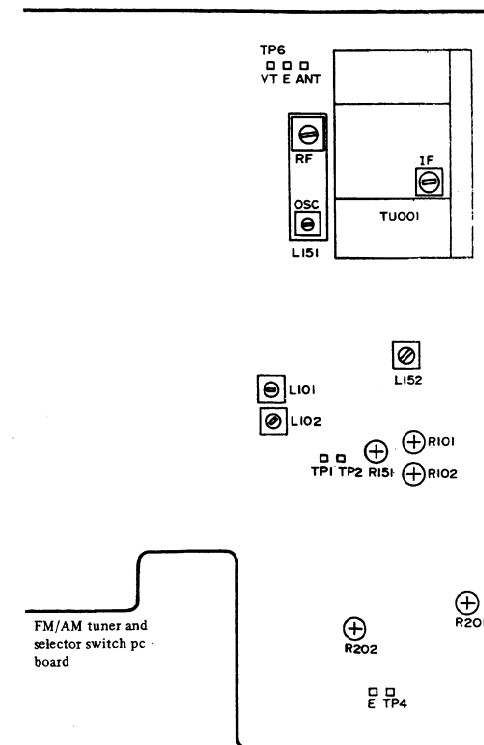


Fig. 2



## PRINTED CIRCUIT BOARD-PARTS LIST

### DISPLAY PC BOARD(NADIS-3281-2/2A/2B)

| CIRCUIT NO. | PART NO.                | DESCRIPTION             |
|-------------|-------------------------|-------------------------|
|             | <b>ICs</b>              |                         |
| U701        | 24130001                | GP1U501S                |
| Q701        | 22240153                | LC6568H-3643            |
| Q704        | <del>22240150</del>     | <del>LC6527C-3608</del> |
|             | <b>Transistors</b>      |                         |
| Q702        | 2211255 or              | 2SC1815(GR) or          |
|             | 2210746                 | 2SC945A(P)              |
| Q705        | 2211455 or              | 2SA1015(GR) or          |
|             | 2210803                 | 2SA733(P)               |
|             | <b>Fluorescent tube</b> |                         |
| Q703        | 212054                  | 7-BT-95GK               |
|             | <b>Lamp</b>             |                         |
| Q706        | 210064A                 | 6.3V,0.25A              |
|             | <b>Diodes</b>           |                         |
| D702-D715   | 223163                  | 1SS133                  |
| D716,D717   | 223163                  | 1SS133 <G/W>            |
| D718        | 224650822,              | 05AZ8.2Y or             |
|             | 224150822 or            | HZ8.2EB2                |
|             | 224450822               | MTZ8.2B                 |
| D719        | 223163                  | 1SS133                  |
| D720        | 224150562 or            | 05AZ5.6Y or             |
|             | 224650562               | HZ5.6EB2                |
| D733-D735   | 223163                  | 1SS133                  |
|             | <b>L.E.Ds</b>           |                         |
| D723,D725   | 225137CG,               | SEL2413ECG,             |
| D727        | 225137DG or             | SEL2413EDG or           |
|             | 224137DY                | SEL2413EDY              |
| D724,D726   | 225142                  | SEL2913K                |
| D728        | 225142                  | SEL2913K                |
| D731        | 225141                  | SEL2213C                |
|             | <b>Osc. elements</b>    |                         |
| X701        | 3010099                 | CSA4.00MG,Ceramic       |

|           |                   |                                  |
|-----------|-------------------|----------------------------------|
| X702      | 3010119           | CSB-1000D,Ceramic                |
|           | <b>Capacitors</b> |                                  |
| C702      | 3020027 or        | 0.047F,5.5V or                   |
|           | 3000051           | 0.047F,5.5V,Super                |
| C704      | 354780109         | 1 $\mu$ F,50V,Elect.             |
| C707,C715 | 354782299         | 0.22 $\mu$ F,50V,Elect.          |
| C708      | 354741009         | 10 $\mu$ F,16V,Elect.            |
|           | <b>Resistors</b>  |                                  |
| R710      | 49163473404       | 47kohm $\times$ 4, 1/10W,Network |
| R734,R735 | 49163104404       | 100kohm $\times$ 4,1/10W,Network |
|           | <b>Switches</b>   |                                  |
| S701-S724 | 25035548          | NPS-111-S510                     |
| S725      | 25065286          | NSS-22112,Band <W>               |
|           | <b>Relay</b>      |                                  |
| RL701     | 25065298          | NRL-1P1A-DC12-40                 |
|           | <b>Holder</b>     |                                  |
|           | 27190643A         | L.E.D                            |

### SPEAKER TERMINAL PC BOARD(NASW-3279-1/1A)

| CIRCUIT NO. | PART NO. | DESCRIPTION                   |
|-------------|----------|-------------------------------|
| P501,P502   | 25060110 | NTM-4PDMN44,Speaker terminals |

### PREAMPLIFIER PC BOARD(NAAF-3283-2/2A)

| CIRCUIT NO. | PART NO.   | DESCRIPTION |
|-------------|------------|-------------|
|             | <b>ICs</b> |             |
| Q352        | 222579 or  | NJM4560D or |
|             | 222570     | NJM4560DX   |
| Q353        | 222465     | NJM4558D    |

|           |                    |                                        |
|-----------|--------------------|----------------------------------------|
|           | <b>Transistors</b> |                                        |
| Q851      | 2212600            | DTA124ES                               |
|           | <b>Capacitors</b>  |                                        |
| C359,C360 | 354780229          | 2.2 $\mu$ F,50V,Elect.                 |
| C363,C364 | 354741009          | 10 $\mu$ F,16V,Elect.                  |
| C367,C368 | 352983396          | 0.33 $\mu$ F,50V,Non-polar elect.      |
| C373,C374 | 354780229          | 2.2 $\mu$ F,50V,Elect.                 |
| C375-C378 | 354781099          | 0.1 $\mu$ F,50V,Elect.                 |
| C389      | 354780229          | 2.2 $\mu$ F,50V,Elect.                 |
| C851      | 354780339          | 3.3 $\mu$ F,50V,Elect.                 |
|           | <b>Resistors</b>   |                                        |
| R371,R372 | 5104216            | N14RLC50KC22Z, Variable,Bass           |
| R379,R380 | 5104216            | N14RLC50KC22Z, Variable,Treble         |
| R451      | 5104225            | N11RGLC250KW22Z, Variable,Bal-<br>ance |
|           | <b>Switch</b>      |                                        |
| S354      | 25035590           | NPS-122-L552                           |

**SPEAKER SWITCH PC BOARD(NASW-3278-2/2A)**

| CIRCUIT NO. | PART NO.  | DESCRIPTION                                        |
|-------------|-----------|----------------------------------------------------|
| L501,L502   | 231001    | S-1.3B,Coils                                       |
| R549,R550   | 442520474 | 4.7ohm,1/2W,Metal oxide film<br>resistors          |
| R551,R552   | 441623914 | 390ohm,1W,Metal oxide film resis-<br>tors          |
| S502,S503   | 25035517  | NPS-222-L479,Push switch                           |
| P503        | 25045187  | HLJ-0541-01-010,Stereo headphone<br>terminal <D/W> |
|             | 25045139  | HLJ-0540-01-010,Stereo headphone<br>terminal<G>    |
|             |           | nals                                               |

**SPEAKER SWITCH PC BOARD**

NOTE: <D>: Only 120V model  
<G>: Only 220V/240V models  
<W>:Only Worldwide model

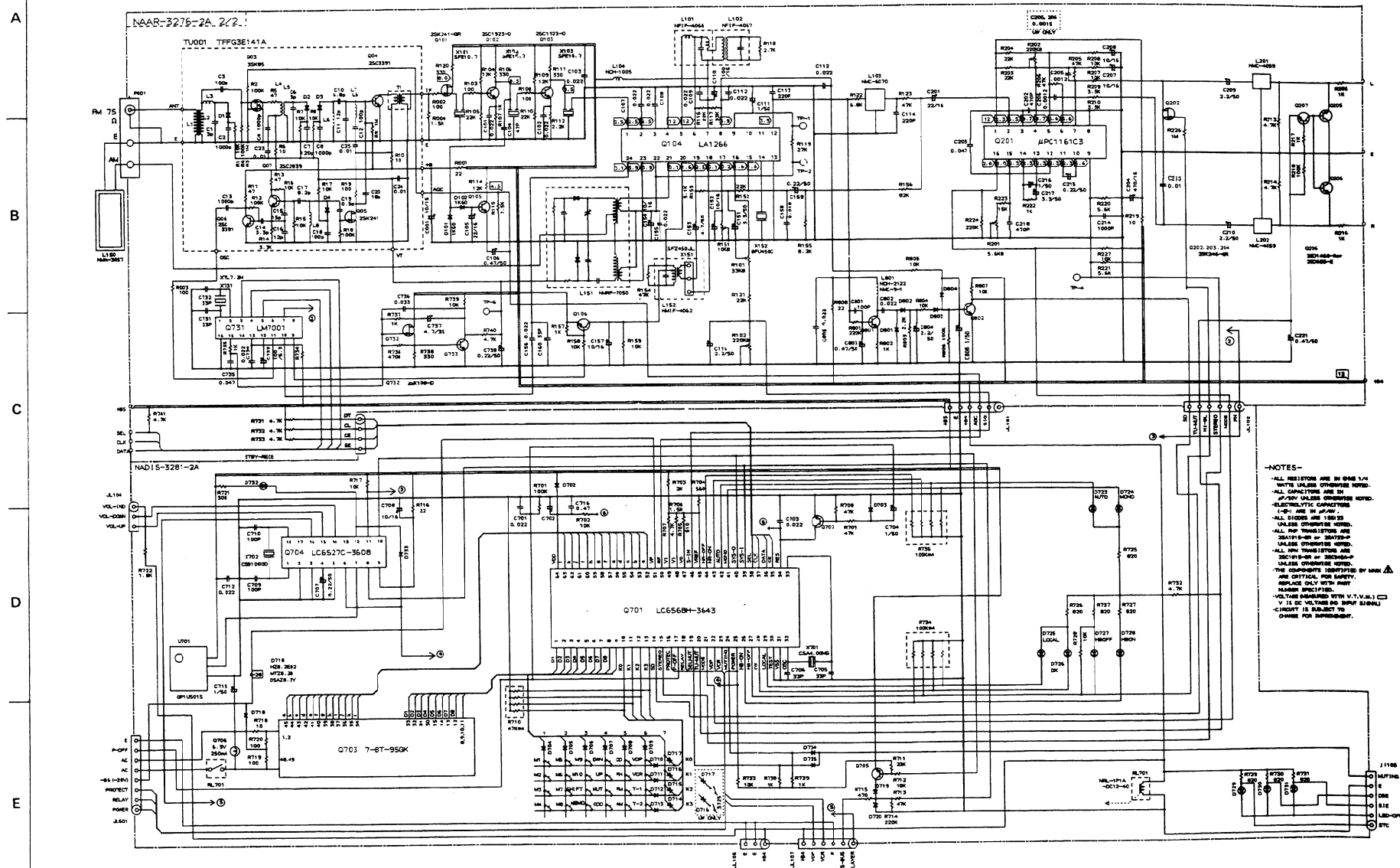


**- 120V MODEL -**

**NOTES-**

- ALL RESISTORS ARE IN OHMS  $\pm$  5% UNLESS OTHERWISE NOTED
- ALL CAPACITORS ARE IN  $\mu$ F UNLESS OTHERWISE NOTED
- ELECTROLYTIC CAPACITORS (E-F) ARE IN  $\mu$ F
- ALL DIODES ARE 1N4148 UNLESS OTHERWISE NOTED
- ALL PNP TRANSISTORS ARE 2N4101-OR OF 2N4733-P UNLESS OTHERWISE NOTED
- ALL NPN TRANSISTORS ARE 2N4105-OR OF 2N3904-P UNLESS OTHERWISE NOTED
- THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR SAFETY.
- REPLACE ONLY WITH PART NUMBER SPECIFIED.
- THE POWER SUPPLY IS A 5-VOLT 150 MA VOLTAGE (NO INPUT SIGNAL)
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

## SCHEMATIC DIAGRAM

-AMPLIFIER SECTION-  
-220V MODEL-



# PRINTED CIRCUIT BOARD-PARTS LIST

FM/AM TUNER AND SELECTOR CIRCUIT PC BOARD(NAAR  
-3276-2/2A/2B)

| CIRCUIT NO. | PART NO.            | DESCRIPTION       |
|-------------|---------------------|-------------------|
| TU001       | 240070              | TFFG1U116A <D>    |
|             | 240081              | TFFG3E <G/W>      |
|             | <b>ICs</b>          |                   |
| Q104        | 22240039            | LA1266            |
| Q201        | 222678              | $\mu$ PC1161C3    |
| Q301        | 22240079            | LC7821            |
| Q302        | 22240158            | LC7823            |
| Q731        | 22240090            | LM7001            |
|             | <b>Transistors</b>  |                   |
| Q101        | 2212195             | 2SK241(GR) <G/W>  |
| Q102        | 2211723             | 2SC1923(O)        |
| Q103        | 2211723             | 2SC1923(O) <G/W>  |
| Q105        | 2211255 or          | 2SC1815(GR) or    |
|             | 2210746             | 2SC945A(P)        |
| Q106,Q207   | 2211455             | 2SA1015(GR)       |
| Q202        | 2211945             | 2SK246(GR)        |
| Q205,Q206   | 2211705 or          | 2SD655(E) or      |
|             | 2212794             | 2SD1468(R)        |
| Q303,Q304   | 2211255 or          | 2SC1815(GR) or    |
|             | 2210746             | 2SC945A(P)        |
| Q451,Q452   | 2212285 or          | 2SC2878(A) or     |
|             | 2212286             | 2SC2878(B)        |
| Q501,Q502   | 2211371 or          | 2SC2259(O-001) or |
|             | 2211372             | 2SC2259(O-002)    |
| Q503-Q506   | 2211455             | 2SA1015(GR)       |
| Q507-Q510   | 2211732 or          | 2SC1845(F) or     |
|             | 2211733             | 2SC1845(E)        |
| Q511,Q512   | 2211353 or          | 2SA949(O) or      |
|             | 2211354             | 2SA949(Y)         |
| Q513,Q514   | 2211633 or          | 2SC2229(O) or     |
|             | 2211634             | 2SC2229(Y)        |
| Q732        | 2212294             | 2SK108(D)         |
| Q733,Q801   | 2211255 or          | 2SC1815(GR) or    |
| Q802,Q892   | 2210746             | 2SC945A(P)        |
| Q881,Q891   | 2211455             | 2SA1015(GR)       |
| Q903        | 2211353 or          | 2SA949(O) or      |
|             | 2211354             | 2SA949(Y)         |
| Q951,Q971   | 2211255 or          | 2SC1815(GR) or    |
| Q972        | 2210746             | 2SC945A(P)        |
| Q952        | 2211643 or          | 2SA965(O) or      |
|             | 2211644             | 2SA965(Y)         |
| Q953        | 2211792 or          | 2SA992(F) or      |
|             | 2211793             | 2SA992(E)         |
|             | <b>Diodes</b>       |                   |
| D101,D102   | 223132              | 1K60              |
| D801-D804   | 223163              | 1SS133            |
| D881        | 224651001 or        | HZ10EB1 or        |
|             | 224151001           | 05AZ10X           |
| D891        | 223163              | 1SS133            |
| D901        | 22380022            | RBV402            |
| D902,D903   | 224151301 or        | 05ZA13X or        |
|             | 224651301           | HZ13EB1           |
| D904        | 223862 or           | WL01 or           |
|             | 223890              | W01RL             |
| D905        | 223880 or           | GP101N4003 or     |
|             | 223896              | 1N4003F           |
| D908        | 224153001 or        | 05AZ30X or        |
|             | 224653001           | HZ30EB1           |
| D951        | 223163              | 1SS133            |
| D971,D972   | 224650623 or        | HZ6.2EB3 or       |
|             | 224150623           | 05AZ6.2Z          |
|             | <b>Transformers</b> |                   |
| L101        | 233389              | NFIF-4066         |
| L102        | 233390              | NFIF-4067         |
| L152        | 232139              | NMIF-4062         |

| CIRCUIT NO.      | PART NO.               | DESCRIPTION                    |
|------------------|------------------------|--------------------------------|
|                  | <b>Coils</b>           |                                |
| L103             | 233383                 | NMC-6070 <G/W>                 |
| L104             | 233105                 | NCH-1005                       |
| L201,L202        | 233355A                | NMC-4059                       |
| L801             | 231081 or              | NCH-2129 or                    |
|                  | 233031                 | NMC-9-1                        |
|                  | <b>RF block</b>        |                                |
| L151             | 232148                 | NMRF-7050                      |
|                  | <b>Ceramic filters</b> |                                |
| X101,X102        | 3010071                | SFE10.7MA5 (RED) <D>           |
| X101-X103        | 3010137                | SFE10.7MMK <G/W>               |
| X151             | 3010123                | SFZ450JL                       |
| X152             | 3010076                | BFU450C                        |
|                  | <b>X'tal</b>           |                                |
| X731             | 3010073                | XTL-7.2M                       |
|                  | <b>Capacitors</b>      |                                |
| C001             | 354741009              | 10 $\mu$ F,16V,Elect.          |
| C105             | 354742209              | 22 $\mu$ F,16V,Elect.          |
| C106             | 354784799              | 0.47 $\mu$ F,50V,Elect.        |
| C110             | 354741019              | 100 $\mu$ F,16V,Elect.         |
| C111             | 354780109              | 1 $\mu$ F,50V,Elect.           |
| C116             | 354780229              | 2.2 $\mu$ F,50V,Elect.         |
| C151             | 354780339              | 3.3 $\mu$ F,50V,Elect.         |
| C152             | 354741009              | 10 $\mu$ F,16V,Elect.          |
| C153             | 354780479              | 4.7 $\mu$ F,50V,Elect.         |
| C154,C157        | 354741009              | 10 $\mu$ F,16V,Elect.          |
| C159             | 354782299              | 0.22 $\mu$ F,50V,Elect.        |
| C201             | 354742209              | 22 $\mu$ F,16V,Elect.          |
| C204             | 354744719              | 470 $\mu$ F,16V,Elect.         |
| C207,C208        | 354741009              | 10 $\mu$ F,16V,Elect.          |
| C209,C210        | 354780229              | 2.2 $\mu$ F,50V,Elect.         |
| C215             | 354782299              | 0.22 $\mu$ F,50V,Elect.        |
| C216             | 354780109              | 1 $\mu$ F,50V,Elect.           |
| C217             | 354780339              | 3.3 $\mu$ F,50V,Elect.         |
| C218             | 370134714              | 470pF $\pm$ 5%,100V,APS        |
| C221             | 354784799              | 0.47 $\mu$ F,50V,Elect.        |
| C331-C334        | 354780229              | 2.2 $\mu$ F,50V,Elect.         |
| C335-C337        | 354780339              | 3.3 $\mu$ F,50V,Elect.         |
| C501,C502        | 354781009              | 10 $\mu$ F,50V,Elect.          |
| <u>C509,C510</u> | <u>354722219</u>       | 220 $\mu$ F, 6.3V,Elect.       |
| C529,C530        | 354780479              | 4.7 $\mu$ F,50V,Elect.         |
| C733             | 354721019              | 100 $\mu$ F, 6.3V,Elect.       |
| C737             | 354780479              | 4.7 $\mu$ F,50V,Elect.         |
| C738             | 354782299              | 0.22 $\mu$ F,50V,Elect.        |
| C803             | 354784799              | 0.47 $\mu$ F,50V,Elect.        |
| C804             | 354780229              | 2.2 $\mu$ F,50V,Elect.         |
| C806             | 354780109              | 1 $\mu$ F,50V,Elect.           |
| C903,C905        | 335251039A             | 0.01 $\mu$ F,500V,Ceramic      |
| C906,C907        | 3504225                | 8200 $\mu$ F,50V,Elect.        |
| C908,C909        | 354761019              | 100 $\mu$ F,35V,Elect.         |
| C910,C911        | 354744719              | 470 $\mu$ F,16V,Elect.         |
| C912             | 335251039A             | 0.01 $\mu$ F,500V,Ceramic      |
| C917             | 354764709              | 47 $\mu$ F,35V,Elect.          |
| C918             | 354762229              | 2200 $\mu$ F,35V,Elect.        |
| C919             | 354761019              | 100 $\mu$ F,35V,Elect.         |
| C921,C924        | 354741009              | 10 $\mu$ F,16V,Elect.          |
| C922             | 354761019              | 100 $\mu$ F,35V,Elect.         |
|                  | <b>Resistors</b>       |                                |
| R101             | 5210067                | N06HR33KBD,Semi-fixed          |
| R102             | 5210072                | N06HR220KBD,Semi-fixed         |
| R151             | 5210064                | N06HR10KBD,Semi-fixed          |
| R201             | 5210062                | N06HR4.7KBD,Semi-fixed         |
| R202             | 5210072                | N06HR220KBD,Semi-fixed         |
| R339,R340        | 49163105404            | 1Mohm $\times$ 4,1/10W,Network |
| R529,R530        | 442522704              | 27ohm,1/2W,Metal oxide film    |
| R531,R532        | 442529104              | 91ohm,1/2W,Metal oxide film    |

## POWER AMPLIFIER PC BOARD

| CIRCUIT NO. | PART NO.           | DESCRIPTION                             |
|-------------|--------------------|-----------------------------------------|
| R547,R548   | 441620474          | 4.7ohm,1W,Metal oxide film              |
| R553,R554   | 442520104          | 1ohm,1/2W,Metal oxide film              |
| R902-R905   | 441623614          | 360ohm,1W,Metal oxide film              |
| R906        | 442524794          | 0.47ohm, 1/2W,Metal oxide film<br><D/W> |
| R907        | 442521824          | 1.8kohm,1/2W,Metal oxide film           |
| R908        | 441620474          | 4.7ohm,1W,Metal oxide film              |
| R909        | 441622204          | 22ohm,1W,Metal oxide film               |
| R913        | 442529104          | 91ohm, 1/2W,Metal oxide film            |
|             | <b>Relay</b>       |                                         |
| RL501       | 25065339           | NRL-2P5A-DC24-046                       |
|             | <b>Terminals</b>   |                                         |
| P001        | 25060085           | NTM-4PDMN29,Antenna <D>                 |
|             | 25060087           | NTM-2PDMN31,Antenna <G/W>               |
| P301-P303   | 25045213           | NPJ-6PDBL-92                            |
|             | <b>Switch</b>      |                                         |
| S301        | 25065286           | NPS-22112,VCR mode                      |
|             | <b>Sockets</b>     |                                         |
| P101,P102   | 25050270           | NSCT-6P98                               |
| P402,P602   | 25050270           | NSCT-6P98                               |
| P103        | 25050268           | NSCT-4P96                               |
| P401        | 25050275           | NSCT-11P103                             |
| P601        | 25050272           | NSCT-8P100                              |
|             | <b>Fuse</b>        |                                         |
| F906        | 252070             | 1A-SE-EAK,Secondary <G>                 |
|             | <b>Fuseholders</b> |                                         |
| F906a       | 25050065           | YSH403T <G>                             |
|             | <b>Radiator</b>    |                                         |
|             | 27160166           |                                         |

NOTE: <D>: Only 120V model  
 <G>: Only 220V/240V models  
 <W>: Only Worldwide model

## POWER AMPLIFIER PC BOARD(NAAF-3277-2)

| CIRCUIT NO. | PART NO.                    | DESCRIPTION                          |
|-------------|-----------------------------|--------------------------------------|
|             | <b>Transistors</b>          |                                      |
| Q515,Q516   | 2211255                     | 2SC1815(GR)                          |
| Q517,Q518   | 2212653 or 2212654          | 2SC3421(O) or 2SC3421(Y)             |
| Q519,Q520   | 2212643 or 2212644          | 2SA1358(O) or 2SA1358(Y)             |
| Q521,Q522 ☆ | 2201703, 2201704 or 2201706 | 2SC3855(O), 2SC3855(Y) or 2SC3855(P) |
| Q523,Q524 ☆ | 2201693, 2201694 or 2201696 | 2SA1491(O), 2SA1491(Y) or 2SA1491(P) |

CAUTION: Replacement for transistor of mark ☆,if necessary, must be made from the same beta group (HFE) as the original type.

|           |                    |                                      |
|-----------|--------------------|--------------------------------------|
|           | Ex. 2SC3855(O)     | 2SA1491(O)                           |
|           | Same beta group    |                                      |
| Q601-Q604 | 2211732 or 2211733 | 2SC1845(F) or 2SC1845(E)             |
| Q605      | 2211792 or 2211793 | 2SA992(F) or 2SA992(E)               |
|           | <b>Diodes</b>      |                                      |
| D501,D502 | 4000120            | KB265                                |
|           | <b>Capacitors</b>  |                                      |
| C603      | 354722219          | 220 $\mu$ F, 6.3V,Elect.             |
| C604      | 354780479          | 4.7 $\mu$ F,50V,Elect.               |
|           | <b>Resistors</b>   |                                      |
| R533,R534 | 5210064            | N06HR10KBD,Semi-fixed                |
| R539,R540 | 442522714          | 270ohm,1/2W,Metal oxide film         |
| R541,R542 | 441720104          | 1ohm,2W,Metal oxide film             |
| R543-R546 | 4000080 or 4500022 | 0.47ohm,5W,Metal plate               |
|           | <b>Terminals</b>   |                                      |
|           | 25060118           | NTM-1S52,For leg of power transistor |

# PRINTED CIRCUIT BOARD-PARTS LIST

## VIDEO TERMINAL PC BOARD(NAETC-3286-1/1A)

| CIRCUIT NO. | PART NO.              | DESCRIPTION                  |
|-------------|-----------------------|------------------------------|
|             | <b>ICs</b>            |                              |
| Q251        | 222840661             | 4066B                        |
| Q281        | 22240145              | LC6527C-3547                 |
| Q282        | 222807                | $\mu$ PA81C                  |
|             | <b>Transistors</b>    |                              |
| Q252        | 2211455 or<br>2210803 | 2SA1015(GR) or<br>2SA733(P)  |
| Q253-Q256   | 2211255 or<br>2210746 | 2SC1815(GR) or<br>2SC945A(P) |
|             | <b>Diode</b>          |                              |
| D281        | 224650512             | HZ5.1EB2 or                  |
|             | 224150512             | 05AZ5.1Y                     |
| D282        | 223163                | 1SS133                       |
|             | <b>Osc. element</b>   |                              |
| X281        | 3010099               | CSA4.00MG,Ceramic            |
|             | <b>Capacitors</b>     |                              |
| C251-C253   | 354741009             | 10 $\mu$ F,16V,Elect.        |
| C254,C255   | 354724719             | 470 $\mu$ F,6.3V,Elect.      |
| C256,C281   | 354741009             | 10 $\mu$ F,16V,Elect.        |
| C284        | 354784799             | 0.47 $\mu$ F,50V,Elect.      |
|             | <b>Terminals</b>      |                              |
| P251        | 25045216              | NPJ-4PDBL94                  |
| P282        | 25045172              | HSJ1003-01-020               |
|             | <b>Socket</b>         |                              |
| P283        | 25050294              | NSCT-8P121                   |

## VOLUME PC BOARD(NAAF-3282-1/1A)

| CIRCUIT NO. | PART NO.  | DESCRIPTION                            |
|-------------|-----------|----------------------------------------|
| Q351        | 22240050  | $\mu$ PC4570C,IC                       |
| Q871        | 222963    | LB1630,IC                              |
| C351,C352   | 354780229 | 2.2 $\mu$ F,50V,Elect. capacitors      |
| C355,C356   | 354721019 | 100 $\mu$ F,6.3V, Elect. capacitors    |
| C357,C358   | 354780229 | 2.2 $\mu$ F,50V,Elect. capacitors      |
| C394,C395   | 354741019 | 100 $\mu$ F,16V,Elect. capacitors      |
| C871        | 354741009 | 10 $\mu$ F,16V,Elect. capacitor        |
| R351,R352   | 5104234   | N16RGM50KA30F,Variable resistor,Volume |
| P351        | 2000635A  | NSAS-4P591,Socket                      |
|             | 25050270  | NSCT-6P98,Socket                       |

## VOLUME INDICATOR PC BOARD(NADIS-3285-1)

| CIRCUIT NO. | PART NO.            | DESCRIPTION                     |
|-------------|---------------------|---------------------------------|
| D871        | 225241 or<br>225242 | SEL2210R-C or<br>SEL2210R-D,LED |
|             | 27190545            | Holder,LED                      |

## CONST. VOLTAGE CIRCUIT PC BOARD(NAETC-3280-1)

| CIRCUIT NO. | PART NO.  | DESCRIPTION    |
|-------------|-----------|----------------|
| Q901        | 222780125 | NEC 78M12HF,IC |
| Q902        | 222780055 | NEC 78M05HF,IC |
| D907        | 223163    | 1SS133,Diode   |

## SWITCH PC BOARD(NAAF-3284-2)

| CIRCUIT NO. | PART NO. | DESCRIPTION                       |
|-------------|----------|-----------------------------------|
| R407,R408   | 6182005  | N25LGL200KRD10Z,Variable resistor |

## EQUALIZER AMPLIFIER PC BOARD(NAAF-3054-2/3)

| CIRCUIT NO. | PART NO.                 | DESCRIPTION               |
|-------------|--------------------------|---------------------------|
|             | <b>IC</b>                |                           |
| Q071        | 22240191 or<br>222570    | NJM4565DD or<br>NJM4560DX |
|             | <b>Elect. capacitors</b> |                           |
| C071,C072   | 354780229                | 2.2 $\mu$ F,50V           |
| C077,C078   | 354721019                | 100 $\mu$ F,6.3V          |
| C083,C084   | 354780229                | 2.2 $\mu$ F,50V           |
| C085,C086   | 354742219                | 220 $\mu$ F,16V           |
|             | <b>Plug</b>              |                           |
| P071        | 25055334                 | NPLG-9P317                |

NOTE: <D>: Only 120V model  
<G>: Only 220V/240V models  
<W>: Only Worldwide model

## POWER SUPPLY CIRCUIT PC BOARD(NAPS-3287-1/1A/1B/1C)

| CIRCUIT NO. | PART NO.                        | DESCRIPTION                                                 |
|-------------|---------------------------------|-------------------------------------------------------------|
| C901,C902   | 3500065A                        | DE7150FZ103PAC400V/125V, Capacitor IS                       |
| R901        | 431523355                       | 3.3Mohm,1/2W,Solid resistor <D>                             |
| S902        | <del>25035550</del>             | NPS-111-L512P,Power                                         |
| RL901       | <del>25065269</del><br>25065248 | NRL-1P5A-DC12-36,Relay <D><br>NRL-1P15A-DC12-29,Relay <G/W> |
| F901a       | 250113                          | SN5051,Fuseholders <D/W>                                    |
| F901        | 252050                          | 5A(ST-6),Primary fuse <D/W>                                 |
| F902a       | 25050065                        | YSH-403T,Fuseholders <G/W/Q>                                |
| F902        | 252075                          | 2.5A-SE-EAK,Primary fuse <G/W/Q>                            |
| F903a       | 25050065                        | YSH-403T,Fuseholders <G>                                    |
| F903        | 252075                          | 2.5A-SE-EAK,Fuse for AC outlet <G>                          |
|             | 29360626-1                      | Label, fuse <D>                                             |

NOTE: <D>: Only 120V model  
<G>: Only 220V model  
<W>: Only Worldwide model  
<Q>: Only 240V model

NOTE: THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

# DISASSEMBLING PROCEDURES

## 1. Top cover

Remove a screw (3TTS+8BQ(BC)) holding the top cover and the back panel.

Remove the four screws (3TTS+8B(BC)) holding the back panel and the chassis.

## 2. Front panel

Remove the top cover.

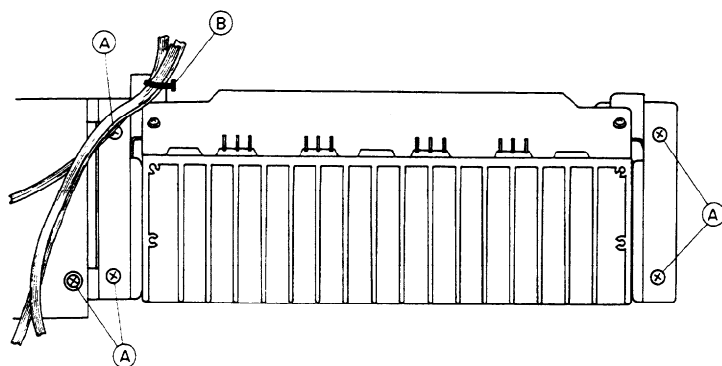
Remove the six screws (3TTP+8P(BC)) holding the front panel and the front basket.

## 3. Power amplifier pc board

Remove the top cover.

Remove the five screws A.

Cut the binder B.



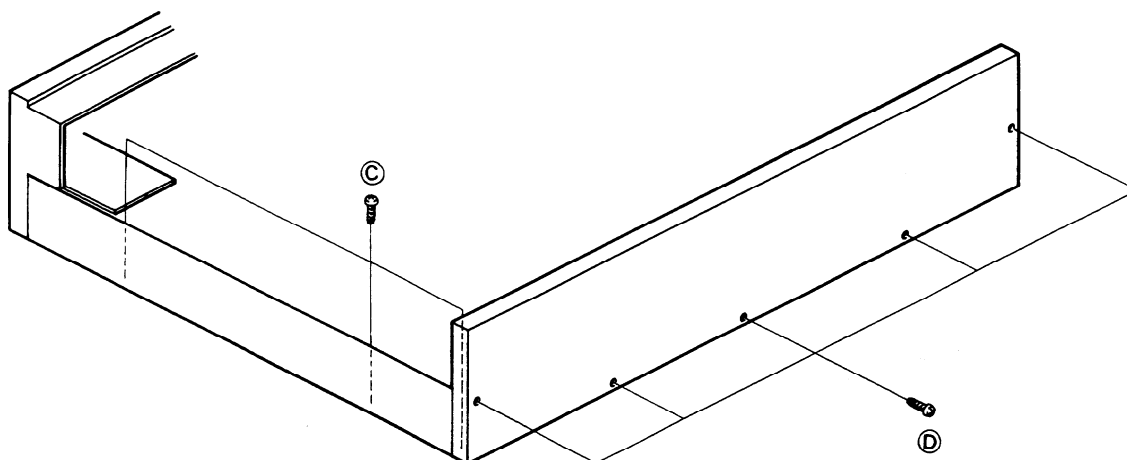
## 4. FM/AM tuner and selector switch pc board

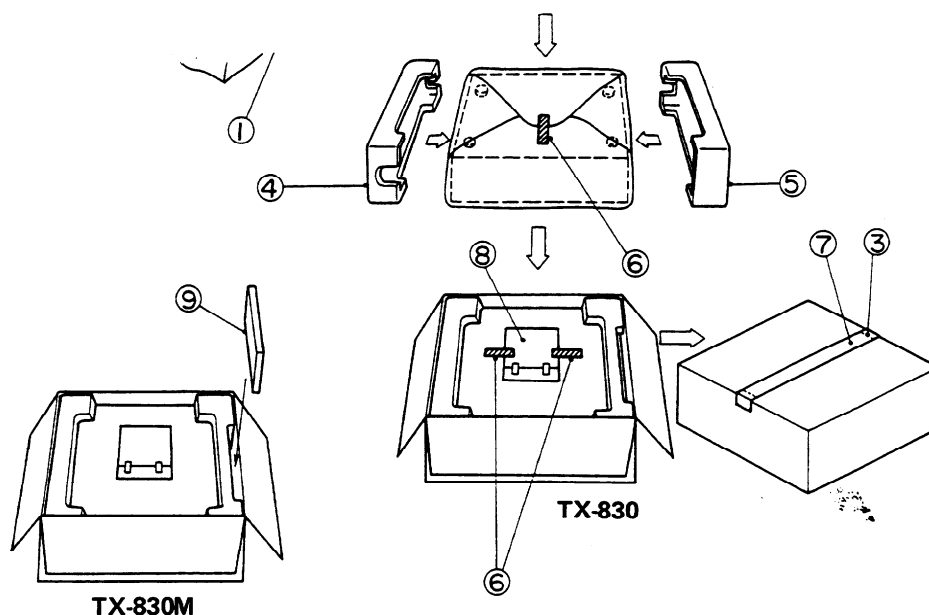
Remove the top cover.

Remove the three screws C holding the pc board and chassis.

Remove the five screws D holding the back panel and chassis.

Remove the pc board from the two holders.





**REF. NO. PART NO. DESCRIPTION**

|   |                     |                                                |
|---|---------------------|------------------------------------------------|
| 1 | 29100034            | 850×650mm,Poly-vinyl bag                       |
|   | 29095012-1          | 800×500mm,Protection sheet                     |
| 2 | 29051692            | Master carton box (TX-830)                     |
|   | 29051693            | Master carton box (TX-830M)                    |
| 3 | 282301              | Sealing hook                                   |
| 4 | 29091263            | Pad R                                          |
| 5 | 29091262            | Pad L                                          |
| 6 | 29110032            | Adhesive tape                                  |
| 7 | 260012              | Damplon tape                                   |
| 8 | Accessory bag ass'y |                                                |
|   | <b>-120V model-</b> |                                                |
|   | 29341252            | Instruction manual                             |
|   | 292064B             | FM antenna                                     |
|   | 232140              | NMA-3057,AM loop antenna                       |
|   | 2010169             | Connection cord for RI                         |
|   | 3010054             | UM-3,Two batteries (TX-830)                    |
|   |                     | UM-3,Four batteries (TX-830M)                  |
|   | 24140021            | RC-118S.Remote control transmitter<br>(TX-850) |
|   | 29380091            | Caution sheet (U.S.A. model)                   |
|   | 29100097            | 250×350mm,Poly-vinyl bag                       |
|   | 29365019            | Warranty card (U.S.A. model)                   |
|   | 29358002F           | Service station list (U.S.A. model)            |

**-220V/240V models-**

|          |                                     |
|----------|-------------------------------------|
| 29341254 | Instruction manual                  |
| 292092   | FM antenna                          |
| 232140   | NMA-3057, AM loop antenna           |
| 2010169  | Connection cord for RI              |
| 3010054  | UM-3, Two batteries                 |
| 24140025 | RC-119S, Remote control transmitter |
| 29100097 | 250×350mm, Poly-vinyl bag           |
| 25060123 | FM adaptor (240V model)             |

**-Worldwide model-**

|          |                                                                              |
|----------|------------------------------------------------------------------------------|
| 29341254 | Instruction manual                                                           |
| 292092   | FM antenna                                                                   |
| 232140   | NMA-3057, AM loop antenna                                                    |
| 2010169  | Connection cord for RI                                                       |
| 3010054  | UM-3, Two batteries                                                          |
| 24140025 | RC-119S, Remote control transmitter                                          |
| 29100097 | 250×350mm, Poly-vinyl bag                                                    |
| 25060123 | FM adaptor                                                                   |
| 25055018 | CV-K-1, Conversion plug                                                      |
| 24140024 | RC-AV10, Remote control transmitter (TX-830M)                                |
| 29341248 | Instruction manual for remote control (Refer the service manual of RC-AV10M) |

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